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ABSTRACT

As part of a project designed to identify appropriate and feasible methods of evaluating vocational education with respect to its outcomes, this bibliography contains descriptive and evaluative annotations of a selection of empirical studies of vocational education outcomes. Following a technical introduction discussing the methodological issues emphasized in the evaluative comments, thirty-one descriptive annotations are given. The annotation of each of the studies presents a discussion of the research questions and hypotheses; the study design, sample, and time frame; the statistical analysis; and the results and conclusions. It concludes with an evaluative segment addressing some of the methodological and substantive issues inherent in each study. A summary epilogue provides a discussion of the findings and methodological issues in the collection of studies. Three indexes (author, sponsor, and educational level) are provided. (LRA)

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Bibliography Series No. 49

VOCATIONAL EDUCATION OUTCOMES:
AN EVALUATIVE BIBLIOGRAPHY
OF EMPIRICAL STUDIES

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in Vocational Education
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U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Office of Education

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FOREWORD

Vocational education has been evaluated through many empirical studies in recent years, partly in response to the evaluation mandate included in the Vocational Education Amendments of 1968. Although context, inputs, and processes are still subject to scrutiny, increasing attention has been focused on products, short-term effects, and long-term impacts as the concept of accountability has been applied to all areas of education.

This bibliography provides descriptive annotations of thirty-one studies, evaluative comments on each of those studies, a technical introduction discussing the methodological issues emphasized in the evaluative comments, and a summary epilogue discussing the substantive findings and methodological issues in the collection of studies reviewed. Thus, this document may be useful to a variety of audiences--from vocational education specialists to professors and graduate students to employment and training planners, Congressional staff, and other individuals interested in vocational education.

Vocational Education Outcomes: An Evaluative Bibliography of Empirical Studies originally appeared under the title "Vocational Education Outcome Studies: An Evaluative Annotated Bibliography Including an Appendix of Key Related Literature," Attachment A in Vocational Education Outcomes, Final Report on Year One of the R & D Project "Examining Vocational Education Outcomes and Their Correlates," prepared by Robert L. Darcy, Kathleen A. Bolland, and Joanne Farley, with the assistance of Carolyn M. Taylor, and submitted to the U.S. Office of Education in January 1979. The appendix, published as a separate document, is titled Vocational Education Outcomes: Annotated Bibliography of Related Literature. The report included two other components, both published as separate documents: Vocational Education Outcomes: Perspective for Evaluation; and Vocational Education Outcomes: A Thesaurus of Outcome Questions. Further information on these publications is given on the inside back cover of this document.

In the development of the general report and its various components, a number of people made valuable contributions. Distinguished representatives from business, labor, and education who served on the National Workshop Panel on Vocational Education Outcomes were: Walter G. Davis, American Federation of Labor and Congress of Industrial Organizations; Mary Ellen Hillaire, Evergreen State College (Washington); Addison S. Hobbs, Michigan Department of Education (now with the Maryland Department of Education); O. Louise Lothspeich, Oregon State Advisory Council on Vocational Education; Fred D. Mack, Central State University (Oklahoma); Gerald Q. Miller, Sharon Steel Corporation (Pennsylvania) and Employers National Job Service Improvement Committee; Philip L. Smith, The Ohio State University; Jerry C. Olson, Pittsburgh Public Schools (Pennsylvania); Wallis E. Pereira, Industry Education Council of California; Clio S. Reinwald, Arizona Department of Education; Annell L. Simcoe, Rutgers University; and J. Robert Warmbrod, The Ohio State University.

We are also grateful to Michael D. Hock of Worthington, Ohio, Douglas Sjogren of Colorado State University, and Michael Scriven of the University of San Francisco, who served as consultants for the study; and to the five members of the National Center's Evaluation Technical Advisory Panel--Carol B. Aslanian, College Entrance Examination Board; George C. Copa, University of Minnesota; Donald W. Drewes, Conserva Inc.; Ruth P. Hughes, Iowa State University; and Daniel L. Stufflebeam, Western Michigan University--for their ideas and encouragement.

On behalf of the National Center, I want to express appreciation to the Bureau of Occupational and Adult Education, U.S. Office of Education, for sponsoring this study, to Robert L. Darcy of the National Center staff for directing the Vocational Education Outcomes project, and to Kathleen A. Bolland for preparing this bibliography.

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in Vocational Education

VOCATIONAL EDUCATION OUTCOMES: AN EVALUATIVE BIBLIOGRAPHY OF EMPIRICAL STUDIES[1]

I. INTRODUCTION

This bibliography is the product of a review of vocational education outcomes literature, with a focus on empirical studies. The review was conducted at the outset of a project designed to identify appropriate and feasible methods for evaluating vocational education with respect to its outcomes; and the bibliography was compiled as a resource document for project staff, the vocational education community, and others interested in examining vocational education outcomes. Containing descriptive and evaluative annotations of a selection of empirical studies of vocational education outcomes, it thus provides a sampling of both substantive findings and methodological issues.

Vocational education outcomes are broadly defined as the consequences of vocational programs. These consequences can be attributed to a student's participation in a vocational program and/or the existence of ongoing vocational programs in the community. Outcomes may affect an individual student, society as a whole, or some segment of society such as taxpayers, employers, or a specific community. Vocational programs may be at the secondary or postsecondary level; they may include programs for adults and out-of-school youth. All results, consequences, impacts, or effects of vocational education are considered outcomes whether positive or negative, intended or unintended, short-term or long-term, economic or noneconomic.

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[1] This bibliography was prepared as part of an applied research and development project of the National Center for Research in Vocational Education, "Examining Vocational Education Outcomes and Their Correlates," under a contract with the Bureau of Occupational and Adult Education, Office of Education, U.S. Department of Health, Education, and Welfare. Other products of this study include an essay on evaluating vocational education with respect to outcomes, a thesaurus of vocational education outcome questions, and an annotated bibliography of literature related to vocational education outcomes. Further information on these products is provided on the inside back cover of this document. The author wishes to express appreciation to George Copa, Douglas Sjogren, and Daniel L. Stufflebeam for their review of an earlier draft; to Trisha Arthur for her assistance in gathering documents for review, to Jeanette McConaughy for editorial assistance, to Pauline Jacobs and Pam Davis for creative secretarial support; and her special thanks to Robert L. Darcy, Joanne Farley, Carolyn M. Taylor, and other colleagues at the National Center for their helpful comments and suggestions concerning this evaluative bibliography.

Empirical studies are defined as those studies in which data are collected and analyzed in a way that can be verified and/or replicated by other researchers. Thus, the bibliography includes such documents as reports of local follow-up studies of former vocational students, annual evaluation reports prepared by state vocational education advisory councils, and doctoral dissertations addressing specific vocational education outcomes. Excluded from the bibliography but included in a companion volume[2] are general data-base reports; review and synthesis papers; evaluation methodology papers, evaluation studies focusing on student characteristics, context, resources, goals, or processes of vocational education; and other publications that are related to vocational education evaluation.

The studies annotated in this bibliography were selected through a two-stage process of identification and review. In the first stage, a variety of sources was consulted in a search for documents published since 1968 addressing topics under the broad heading of vocational education evaluation. This encompassing identifier was used in the initial stage since the more narrow term "vocational education outcome studies" is infrequently used and does not even elicit immediate recognition from many vocational education researchers. During this first-stage search, staff of the National Center and other vocational education professionals were consulted, two computer searches were initiated,[3] and bibliographies of already-collected documents were screened.

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[2] Carolyn M. Taylor, Robert L. Darcy, and Kathleen A. Bolland, Vocational Education Outcomes: Annotated Bibliography of Key Related Literature (Columbus: National Center for Research in Vocational Education, The Ohio State University, 1979).

[3] A search of the Educational Resources Information Center (ERIC) system was conducted and references were retrieved and scanned for relevance to the project. Among the descriptors used were vocational education, vocational follow-up, and program evaluation. A search of the Comprehensive Dissertation Index was conducted and references

In the second stage the identified documents were reviewed. Those not reporting empirical studies of the consequences of vocational education were excluded from the bibliography. Those retained for the bibliography were selected to:

1. Reflect the broad scope of vocational education outcomes research
2. Illustrate evaluation research and analysis methods as well as findings
3. Identify research constraints and related problems
4. Include primary sources insofar as possible

Using this identification and review process, thirty-one studies were selected. Bibliographies of those documents were reviewed for other studies and National Center staff and outside consultants were asked to identify other studies that should be included. Although several other studies exist, these sources indicated that they were not so different from those already identified as to constitute important additions. Thus, this listing does not exhaust the available literature, nor is it a random sample of the qualitative variation in research activity. Basically, however, it is indicative of both the substantive and methodological range of evaluations of vocational education outcomes[4] published since 1968.

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[3] retrieved and scanned. Among the descriptors used were vocational, postsecondary, secondary, adult, dropout, outcome, follow-up, Indian, handicapped, disadvantaged, and bilingual. In both searches most of the documents identified were not reports of empirical outcome studies.

[4] Since completion of the bibliography, however, several studies that would have merited inclusion have been brought to the author's attention. A review of these studies and of the procedures followed for selecting studies in general revealed two primary reasons for their exclusion. Some of the documents were not identified at all during the selection process, either because of a mismatch between the ERIC descriptors assigned to the document and those used in the search or because they were not in the ERIC system and were not identified through another source. Other documents were identified but rejected on the basis of their titles and so were not reviewed. For example, the title A Longitudinal Study of Vocational Development and Program Evaluation: Implications for Curriculum Planning and Vocational Guidance by Jerome T. Kapes, Thomas E. Enderlein, and Randall B. Martin (University Park: The Pennsylvania State University, 1974)

The annotation of each of the thirty-one studies begins with a discussion of the research questions and hypotheses; the study design, sample, and time frame; the statistical analyses; and the results and conclusions. It concludes with an evaluative segment addressing some of the salient methodological and substantive issues inherent in each study. Although applied researchers, including evaluators, must balance methodological concerns with concerns for factors affecting the utility of results (such as timeliness), the latter issues are more difficult to assess through reading an evaluation report. The evaluative comments, thus, are intended not to serve as meta-evaluations[5] but to alert the reader to factors influencing the credibility of the reported results. Therefore, questions are raised concerning such issues as appropriateness of design, generalizability of findings, and clarity of reporting. Notable features and strengths of the study are also highlighted. The technical notes following this section provide a further discussion of some methodological issues underlying the evaluative comments.

ED numbers, where provided in the citations, refer to the accession number sequentially assigned to documents as they are processed into the ERIC systems and published in the monthly abstract journal, Resources in Education (RIE, published by the National Institute of Education). The documents, except as noted in RIE, are available from ERIC Document Reproduction Service in either microfiche or paper copy. The address is: P.O. Box 190, Arlington, Virginia 22210. Also, many university libraries have collections of ERIC microfiche. When no ED number is given to a particular document, it presumably has not been entered in the ERIC system.

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[4] suggests a study of how programs were developed and how evaluation information was used in curriculum planning and vocational guidance, and so the document was not reviewed.

[5] Meta-evaluation, that is an in-depth critical evaluation--by a third party--of an evaluation study, is becoming increasingly popular. A thorough meta-evaluation requires access to full contextual information regarding the study and so cannot be done simply through reviewing an evaluation report. For further discussion, see Daniel L. Stufflebeam, Meta-evaluation, Occasional Paper Series, No. 3. Kalamazoo: The Evaluation Center, Western Michigan University, 1974).

II. TECHNICAL NOTES ON ANNOTATING THE EMPIRICAL OUTCOME STUDIES

Evaluation is a term defined in several ways, depending on the orientation of the user. A standard educational evaluation text[6] lists five different usages of the term. For this bibliography, I did not choose any one meaning, but rather annotated documents that are characterized as evaluation reports by their authors or that are used as evaluation reports by some audience. However, I maintain that regardless of definition, the process of evaluation is a process of inquiry. Although evaluation as a generic term may differ from research,[7] when evaluators set out to inquire about a program they are not exempt from the canons of research, from the scientific tenets of "the conduct of inquiry."[8] Although evaluators must balance concern for methodological issues such as validity with concern for practical issues such as timeliness, it is my contention that a timely evaluation report of questionable validity is a more serious error than an untimely but valid report. The latter report may be of use to an audience other than that for which it was intended, whereas the former is of little use to anyone. Thus, although empirical research is not the only legitimate evaluation strategy, and a case may be made for a multiplicity of strategies (including the case study approach, for instance), the evaluative comments are made from an empirical research perspective.

Descriptive and Evaluative Annotations

A checklist of important components of an evaluation report was developed[9] and used to organize each descriptive annotation (see Table I). Its similarity to one that would characterize any other scientific research report is evident.

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[6] Blaine R. Worthen and James R. Sanders, Educational Evaluation: Theory and Practice. (Worthington, Ohio: Charles A. Jones Publishing Co., 1973) p. 20.

[7] For a discussion of this issue, see Worthen and Sanders, Educational Evaluation, pp. 26-38.

[8] A short bibliography of research design texts and evaluation report checklists will conclude these technical notes. See, for instance, Abraham Kaplan, The Conduct of Inquiry: Methodology for Behavioral Science. (Scranton, Penn.: Chandler, 1964).

[9] These components were not drawn from any one source; however, discussions of them can be found in several research

The evaluative comments are more judgmental than the descriptive annotations, both in their substance and in the selection of issues on which to express professional judgment. Although the comments address the methodological issues surrounding the components of the evaluation report checklist, space limitations prevent detailed critiques of every issue.[10] The evaluative comments focus on selected aspects of credibility and policy utility, as far as can be determined from the information given in the report: (1) To what extent are the conclusions warranted? (2) Are the conclusions relevant to the stated purpose of the study? and (3) Can the conclusions be generalized in such a way that they contribute to a body of knowledge about the effects of vocational education? Suggestions for improving further research are made, and the completeness and clarity of the reporting are addressed as well.

To provide a basis for the assessment of credibility and utility, certain information must be presented in the report and that information must indicate that certain methodological practices were followed. The evaluative comments focus on some salient issues. For example, what aspects of the report contribute to the reader's credence in the conclusions? What was done expecially well, and what was lacking? It cannot be overly stressed that every issue is not addressed in every annotation.

Following is a brief discussion of the issues that are emphasized. It should be understood that although an ideal study would be methodologically perfect, situational constraints and imperatives (lack of adequate time, money,

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[9] design texts such as those listed in the reference section concluding these notes. Terminology and relative emphasis vary among authors (reflecting diversity in usage by researchers), but there is little disagreement about the basic components.

[10] A thorough critique of an evaluation report could easily take five to ten pages, and some are even longer. See, for instance, the critiques published in The Journal of Vocational Education Research 1:1 (Winter 1976).

expertise, . . .) can prevent that goal from being reached; these constraints and imperatives are not always discussed in an evaluation report. The negative comments therefore are not meant as derogations but are intended to alert the reader to factors attenuating the credibility of the conclusions.

Table I

CHECKLIST OF COMPONENTS OF AN EVALUATION REPORT

__ Statement of purpose, hypotheses, questions

__ Contextual factors

__ Population, sample

__ Design, data procedures, instruments

__ Data treatment and analysis

__ Results

__ Conclusions, implications, recommendations

__ Sponsor of study, professional identity of evaluator

Completeness and Clarity of Reports

It is important that sufficient detail be included in the report to allow readers to mentally reconstruct the procedures followed, the instruments used, and the groups studied. The readers need this information to judge the appropriateness of the methodology and to determine how similar the programs and students studied are to those they are comparing. Thus, not only must all the requisite information be given, it must be provided without ambiguity. Terms such as "program completers" and "early leavers" must be defined, differences between such groups as "vocational students" and "nonvocational students" must be explained, and the exact data collection and analysis procedures must be described.

Multiple reports are sometimes written, each with information important to a specific audience. In such cases, each version may not contain all the information discussed here. However, when multiple reports have been written, each report should make reference to the other reports, indicating the audiences to which they are addressed and the scope of the included information.

When inquiry is conducted for exploratory purposes, detail sufficient to enable the readers to grasp the general idea of what was done is adequate. However, when the purpose of research is to test an hypothesis, the amount of detail must be such that researchers who read the report can replicate the procedures if they wish. (The topic of verification is covered more fully in the next section.) The accumulation of a body of knowledge is dependent on replication of research. Although statistical analyses can indicate the likelihood that an observed phenomenon is a function of chance, repeated replications of procedures yielding the same findings are necessary to provide further assurance that they were not chance occurrences.

Statement of Purpose, Hypotheses, Questions

When engaging in inquiry, one must distinguish between the "logic of discovery" and the "logic of justification." The logic of discovery applies to the formulation of hypotheses. There are several methods of formulating hypotheses: for example, they may be based on theory, they may be grounded in observation, or they may be strictly hunches.[11] There are no formal rules that exhaust the possible procedures for discovery of hypotheses, but in both scientific and everyday discourse, a number of formal procedures for confirming or verifying hypotheses can be identified.[12] These procedures fall under the rubric of the logic of justification; some of them will be discussed in the following sections. Because the suitability of methodological procedures depends on the purpose of the study (discovery or justification), it is important that an evaluation report include a purpose statement.

The specific objectives, which should be stated as evaluation hypotheses or questions, as well as the overall purpose, will have implications for the choice of methodology.

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[11] Some philosophers of science suggest that an hypothesis derived from a particular theory is more acceptable than one derived from no particular susbstantive context. See, for example, Karl R. Popper, The Logic of Scientific Discovery. Rev. ed. (London: Hutchinson and Co., 1968), Chapter 30.

[12] See, for example, Kaplan, The Conduct of Inquiry.

Again, in order for the reader to judge the suitability of the methodology, the specific objectives of the evaluation endeavor must be stated. The reader is cautioned to review the methodology used in every study to see if it is appropriate and adequate to answer the questions posed.

Contextual Factors

Any contextual factors that may affect the interpretation of the results should be discussed. The time frame is an important example: When was the study conducted? How much time elapsed between the occurrence and the study of it? When were the data analyzed and reported? These time factors are important because, for example: (1) Some event may have occurred during the study affecting its results, even though not directly related to vocational education. (2) One may question the accuracy with which respondents recall details of their first jobs, if questioned ten years later. (3) The accuracy of the researcher's recollections is questionable when data are analyzed two or three years after collection. Other contextual factors include geography and events that are not necessarily indicated by time-frame information (events with far-reaching consequences are generally known by their dates, but more local events are usually recalled from a different standpoint).

Population and Sample

The study's population is the universe of people, objects, or events in which the evaluator is interested. Statistically significant results of a scientific study can be generalized to the designated population if appropriate sampling techniques are used (treated further in the Data Analysis section).

In some cases, researchers are able to collect data from or concerning the entire population. In most cases this is not feasible, however, so the researcher selects a sample from the population. Appropriate sampling techniques must be used to ensure that results from the sample are representative of results that would be obtained if the whole population were studied. The sampling procedure used, therefore, must be specified. Sampling techniques and issues are described in various survey research texts as well as in some more general research texts.

When a sample is chosen but some data are missing because not everyone (a) was available for an interview, (b) returned the questionnaire, or (c) answered all questions, the subset actually used in the study is sometimes referred to as the study sample. What constitutes the study sample and the bases on which it differs from the original sample should be specified.

It is important that full information be reported concerning the population, the original sample, and the study sample. Terms must be defined, procedures must be described (how the sample was chosen, what rules were used to determine which data were unusable . . .), and numbers must be provided (size of the population, size of the original sample, size of the study sample). For example, if it is merely stated that the response rate was 64 percent, it is not clear whether the study sample was 64 percent of the population or of the original sample. Conclusions reached on the basis of a large percentage of returns from a small but carefully selected sample may be more valid than those based on a small percentage of returns from a large population even if the population and the study sample sizes are equal in both cases.

Bias is an important issue related to sampling. When the original sample and/or study sample are not representative of the population, they are said to be biased. Biased samples can be purposefully selected, as when a teacher considers only the best students and then reports that most of the students got jobs; or they can occur beyond the control of the researcher, as when students without jobs fail to return a questionnaire asking about their employment status. Not only should researchers choose sampling and data-gathering techniques to minimize bias, but they should report relevant characteristics of the study sample in comparison with characteristics of the population in an effort to determine the existence of bias. For example, in a study where sex may make a difference, the ratio of males to females in the study sample should be compared with the ratio of males to females in the population. Statistical techniques can be used to overcome problems of bias in some situations.[13]

The size of the study sample is one of the factors contributing to the power of a statistical test. The study sample must be large enough to ensure that if there are true effects, they can be statistically demonstrated. This is somewhat akin to needing a magnifying instrument powerful enough to make observable something that exists but cannot be seen with the naked eye.

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[13] See, for example, William G. Cochran, Sampling Techniques (New York: John Wiley and Sons, 1977).

Design, Data, Procedures, Instruments

The choice of research design, procedures, and data-collection instruments is influenced by such factors as purpose, available resources, and political constraints; trade-offs are inevitable. Although the readers of evaluation reports are generally not in positions to judge the choice of such specifics, they should be able to follow the evaluator's logic in moving from purpose to design.

The basic design issue is validity. Does the chosen design allow warranted conclusions to be drawn about the evalaution questions or hypotheses? One must question whether something other than the treatment (in this context vocational education or some aspect thereof) can be responsible for the observed effect. There are many threats to validity and several research designs have been developed to attenuate them. A brief summary of a few of the common research designs, adapted from a classic text, is presented in Table II.

In addition to deciding on a general research design, the evaluator must make several specific decisions relative to data, procedures, and instrumentation: (1) What is the nature of the data to be collected? (2) From whom should data be collected? (3) When should data be collected? and (4) How should data be collected? The evaluation report must indicate the chosen alternatives and their rationale in sufficient detail that the reader may judge whether the data, procedures, and instrumentation are appropriate and adequate to the purpose of the evaluation. These four issues are interrelated and complex; only a few of the important factors will be discussed here. The research design texts listed at the conclusion of these notes provide much greater detail. One of them includes a discussion of the limitations of research paradigms for evaluation studies.[14]

The general class of data necessary to answer the purpose of an evaluation will be more or less obvious depending on the specificity of the purpose statement, and it is the evaluators who must convince their audiences that they have chosen appropriate outcomes to study and appropriate data to

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[14] Daniel L. Stufflebeam, Walter J. Foley, William J. Gephart, Egon G. Guba, Robert L. Hammond, Howard O. Merriman, and Malcolm M. Provus, Educational Evaluation and Decision Making (Itasca, Illinois: Peacock, 1971), p. 22.

Table II

SOME COMMON RESEARCH DESIGNS

1. The One-Group Pretest-Posttest Design: One group receives a pretest, a treatment, and a posttest. There is no control over the possibility that factors other than the treatment were responsible for any changes that occurred.

2. The Static-Group Comparison: Two intact groups are chosen. Only one receives a treatment; both receive a posttest. There is no adequate assurance that both groups were esentially the same before the one group received the treatment.

3. The Time-Series Experiment: A series of measurements is taken on a group, a treatment is given, and the series is continued. Something other than the treatment may have caused any observed change in pattern.

4. The Nonequivalent Control Group Design: Two intact groups receive a pretest, one group receives a treatment, and both groups receive a posttest. The extent to which some of the threats to validity are controlled depends on the situation.

Source: Adapted from Donald T. Campbell and Julian S. Stanley, Experimental and Quasi-Experimental Designs for Research (Chicago: Rand McNally 1963).

assess those outcomes.[15] Not only must an outcome--for instance, earnings--be specified, but it must also be operationalized; that is, it must be defined in a way that clearly indicates how it is to be measured. Further, the evaluator must justify the operationalization--for instance, on what basis was a choice made from several possible choices, such as weekly earnings, annual earnings, and average earnings.

The general question of data sources raises two more specific questions: (1) Should the data be collected directly from members of the population or from other sources? and (2) What comparisons should be made? For example, information about the job duties of a population of employees could be sought from a sample of the employees or from their employers. Tradeoffs among such factors as accuracy, feasiblity, and cost are sometimes necessary in choosing a data source. The evaluation report should provide a rationale for the choices made.

If conclusions about the effectiveness of vocational education are to be drawn, some comparisons must be made. The variables being studied indicate what should be compared, e.g., earnings, but for purposes of evaluation, these variables must be compared against some standards.[16] The standards may be relative, e.g., one group of graduates compared to another, or they may be absolute, e.g., an employee's performance compared to a stated level of satisfactoriness.

The choice of a standard or of a comparison group is relatively easy when there is a theoretical reason to suspect that the performance of a group should be different after its participation in a vocational education program or different from that of a group that did not participate. Ideally, the theory would even specify the nature of the difference. When evaluators make comparisons, they should specify the rationale for their choice of standards. The reader then can judge whether appropriate comparisons have been made. When standards are not stated it should be indicated that it is left to the readers to compare the descriptive data presented with whatever standards they prefer.

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[15] Further discussions of this point can be found in Joanne Farley, Vocational Education Outcomes: A Thesaurus of Outcome Questions (Columbus: National Center for Research in Vocational Education, The Ohio State University, 1979) and Robert L. Darcy, Vocational Education Outcomes: Perspective for Evaluation (Columbus: National Center for Research in Vocational Education, The Ohio State University, May 1979).

[16] See Eugene J. Webb and others, Unobtrusive Measures: Nonreactive Research in Social Sciences (Chicago: Rand McNally, 1966), pp. 5-10, for a discussion of comparisons.

How the data are to be collected is another issue that involves many tradeoffs. The best technique is often the most expensive (see Table III for some data-collection methods). Once a method, such as personal interviews or mailed questionnaires, has been chosen, an instrument must be selected as well. An instrument may be developed for the research project or one already available may be chosen. In either case, questions of validity and reliability shoud be addressed as well as conditions of administering the instrument.

Table III

SOME DATA-COLLECTION METHODS

METHOD	STRENGTHS	WEAKNESSES
Mechanical Devices (e.g., videotape)	Elimination of human errors Reliability	High cost Complexity
Observation	Natural settings Subtleties perceived by trained observers	Artificial situation created by observer's presence Variation in reliability Meaningful factors possibly overlooked by observer
Questionnaires	Honesty fostered by anonymity Low cost	Possibility of low percentage of returns Respondents' lack of understanding Possibility of superficial responses Response rate biased by nature of the questions

Table III (Continued)

SOME DATA-COLLECTION METHODS

METHOD	STRENGTHS	WEAKNESSES
Interviews	Provision for flexibility Provision for in-depth response	High cost Skilled interviewers required Difficulty of summarizing
Rating Scales and Checklists	Low cost Ease of completion Objective scoring Standardized responses	Not all alternatives encompassed May tell more about respondent than about topic under consideration
Self-Reports	Low cost Inclusion of emotion-laden material	Difficulty of analysis High degree of subjectivity May be threatening
Tests	Reliability can be assesed Items can be analyzed Ease of scoring	Validity of questions may be doubtful Triviality of questions Appropriate alternative responses may not be provided Precision of format may mask poor items
Performance Samples	Direct measure of ability and mastery	Difficulty of administering High cost Problems of reliability Artificial situation
Unobtrusive Measures (e.g., "wear on carpet")	Nonreactive Not consciously biased Availability and measurability	Questions of ethics Questions of validity

Source: Adapted from material presented in Worthen and Sanders, Educational Evaluation, and some other sources.

It is important that an instrument be both valid, that is measure what it is said to measure,and reliable, that is consistent in its measurement. Neither validity nor reliability is inherent in an instrument; both depend on factors of the situation in which the instrument is used. Still, if an instrument has been demonstrated to be valid and reliable in a given situation and it is to be used in a similar situation, assertions of probable validity and reliability are reasonable.

There are several kinds of validity[17] and corresponding ways to assess them, but for present purposes an example will suffice. To assess the capability of Test A to measure the ability of individuals to perform Task X, the test can be given to individuals known to have different levels of X ability. If the variance in scores on Text A corresponds with the known variance in ability to perform X, the test is said to have concurrent validity.

Although there are several ways to assess reliability, it is a unitary concept. If a measuring device consistently yields the same measurement when applied to a phenomenon, it is said to be reliable. Thus, a thermometer that always reads 100°C when placed in boiling water is a reliable instrument, whereas one that varies, either randomly or with some other variable, is not. Although the thermometer is just as reliable if it always reads 90°C when placed in boiling water, it does not validly measure water temperature. The reliability of tests of knowledge is assessed by comparing scores on alternative forms of a test, by comparing scores on odd-numbered items with scores on even-numbered items (assuming that overall, all items test the same pool of knowledge), or by comparing scores on two different administrations of the same test.

Reliability and validity are difficult to distinguish and to assess with certain measures of the hypothesized outcomes of vocational education. Still, it is important to assess them insofar as possible. A questionnaire should not be assumed to elicit required information, from the point of view of the researcher, without some "reality check." Nor should responses to an interview be assumed to be factual.

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[17] Predictive validity, content validity, construct validity, and face validity are among the several types of validity that can be assessed. See J. P. Guilford and Benjamin Fruchter, Fundamental Statistics in Psychology and Education 6th Ed. (New York: McGraw-Hill, 1978).

Questions may be misinterpreted in some cases, and in others a respondent may not have accurate information, or having it, may not want to give it. Questionnaire items may be misunderstood by all individuals in a sample or by some specific set of individuals.

Standard techniques found in research tests for assessing validity and reliability often cannot be applied to measures of vocational education outcomes because they are designed for such measuring devices as multiple-choice tests of knowledge, attitude scales, or performance tests. Still, it is necessary to determine if the techniques used to gather vocational education outcomes data are valid and reliable. A general method that can be used in many instances is pilot-testing. To pilot-test an instrument or other data-gathering technique, evaluators select a small representative sample from the population of interest and collect data from that sample. They then attempt to verify the information received. One procedure is to discuss the data collection device with the members of the sample to determine their understanding of what was being asked. Another is to elicit the same information from another source. For example, if parents are questioned about employment of their children, their information can be verified by questioning the children themselves and their stated employers. If results of a pilot test indicate that the measuring devices accurately measure the content of interest to the evaluator and do so consistently, it is reasonable to assume that the devices are valid and reliable for other samples from that population. Another method that can be used to support claims of validity is the use of a panel of subject-matter experts. The panel would judge whether the instrument, for example a questionnaire or interview schedule, covered the domain of interest.

Another factor related to data collection should be discussed in an evaluation report: the conditions of instrument administration. These conditions may affect reliability and/or validity. For example, little credence can be placed in interview data obtained from untrained interviewers or from data collected in uncomfortable physical conditions (for example, questionnaires completed in a cold room).

Data Analysis

For some purposes, simple presentation of data may be sufficient. Even in these cases, though, care should be taken to guard against misleading tables. When statistical analyses are used, even greater care must be taken. Many assumptions and conditions underlie most statistical techniques and although many can be violated without detracting from the usefulness of a given statistic, some cannot be.[18] It is particularly important to meet assumptions when parameters such as unemployment rates are being estimated, whereas when patterns of outcomes such as job satisfaction are being explored, violations of assumptions may not be so critical.

Results

Interpretation of statistical findings must be done with care.[19] Statistical significance indicates that an observed effect (for example, higher salaries for vocational graduates) is not likely a function of chance variation in the selected sample; but further statistical tests can sometimes be done to indicate how much of the variation is a function of the treatment in question (for example, vocational education). With correlations, for example, when the correlation coefficient is squared and then multiplied by 100, the resultant percentage indicates the variance explained. With large sample sizes, statistical significance is often found even though the explained variance is very low; when this occurs, it indicates that the results have little practical significance. Finally, a careful reading of the report is needed to determine whether the stated results are an outgrowth of the reported data rather than unsubstantiated statements of the author's convictions.

Conclusions, Implications, Recommendations

Some evaluation reports may simply present data and summary results, leaving the policy maker to draw conclusions. When conclusions are drawn, implications stated, and/or recommendations made in a research report, they should be based on the data.

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[18] For example, underlying many statistical techniques are the assumptions that the population is homogeneous and that the variables under study are normally distributed in the population. These assumptions are treated in statistical texts.

[19] See Darrell Huff, How to Lie with Statistics (New York: W. W. Norton and Company Inc., 1954).

Sponsor of Study, Professional Identity of Evaluator

The identity of the sponsor and of the evaluator can affect the credibility of an evaluation report, both positively and negatively. Some sponsors may be known for requiring quality work and others for preferring results that support their positions. Similarly, some evaluators are recognized for accurate, unbiased inquiry whereas others become so involved in the subject of their inquiry that their results are suspect.[20]

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[20] See Ernest Nagel, "The Value-Oriented Bias of Social Inquiry," in May Broadbeck (ed.), Readings in the Philosophy of the Social Sciences (New York: The Macmillan Co., 1968).

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B. Citations and Annotations

The Adequacy of Vocational and Technical Education. South Carolina Advisory Council on Vocational and Technical Education. Columbia: South Carolina Advisory Council on Vocational Education, February 1976, 46 pp. (ED 126 315)

DESCRIPTIVE ANNOTATION:

The South Carolina Advisory Council on Vocational and Technical Education culminates its evaluation responsibilities each year by preparing and publishing an annual evaluation report. It became apparent to the members, however, that "if one is to adequately evaluate the 'effectiveness' of programs, what better perspective exists than that of the employers?" This study was initiated to explore that often-neglected perspective. Many questions were asked:

- Are technical and/or vocational centers a good source of trained, prospective employees?
- Do the centers meet the needs of business and industry?
- Do they meet the needs of the students?
- How do graduates of the centers compare with other employees?
- What is the quality of this education?

Recommendations concerning any aspect of the centers were sought as well.

Ten thousand employers from large companies within the state constituted the population for the study; questionnaires were sent to each of them. Usable returns were received by the cutoff date from 1161 employers, a response rate of 12%. Characteristics of the respondents are discussed and presented in tables. A cross-section of the South Carolina business and industrial community and of the geographic regions of the state was represented. The survey form was mailed in October 1975. The questionnaire does not ask when employers had experience with graduates of vocational and/or technical centers.

The survey questionnaire, drawn up by a consulting firm, was designed to answer the basic questions the advisory council had raised. After review by a committee of the council and by representatives from vocational and technical education, it was revised. The instrument is appended to the study.

The data are presented in tabular form; comparisons are sometimes made between all respondents and those respondents who have hired vocational/technical graduates. Some data are presented as frequencies and percentages of employers giving particular responses to specific questions; others are in the form of average responses and rank orders. Some of the recommendations are listed with the percentage of respondents making each recommendation.

Among the conclusions discussed are the following:

- Employers consider both vocational and technical centers a good source of trained employees, generally rating those employees higher than others.
- Both vocational and technical centers meet the needs of business and industry and of the students, but excel at meeting the needs of students.
- Employers are more familiar with technical education centers/colleges than with area vocational education centers.
- Vocational and technical programs are oriented more to manufacturing than to other categories of business and industry.

Specific recommendations are made to the State Board for Technical and Comprehensive Education, to the State Board for Vocational Education, and to the State General Assembly. Included are recommendations for continued funding and for greater dissemination--to the public--of information regarding available programs.

This study was initiated by the South Carolina Advisory Council on Vocational and Technical Education. The Dunn and Bradstreet, Inc., Marketing Services Division was hired because it had access to the desired population (through computer files of addresses) and because the council had confidence in its research capabilities.

EVALUATIVE COMMENTS:

This study is useful in an exploratory sense because it suggests areas for further research. The low response rate makes such research necessary before findings from the study can be more than suggestive. Additional research could focus on different occupational areas. For example, do employers of trade and industrial students view vocational education differently from employers of business and office students?

Another question that can be raised from this study concerns the extent of experience employers have had with vocational students and what effect, if any, that has on their perceptions. If employers have hired only two students each, one would expect their perceptions to be less indicative of the results of vocational education than the perceptions of those employing hundreds of vocational students.

The researchers selected a large sample hoping to obviate bias both from respondents with vested interests in the program and from those who tend to give answers they believe desired. In further research, an attempt should be made to assess response bias, and techniques of questionnaire construction should be used to minimize some kinds of bias. For example, a forced-choice format can be used to prevent respondents from giving "desirable" responses.

One conclusion drawn in this report is that although vocational and technical centers meet the needs of business and industry, they better meet the needs of students. This issue may deserve further study. Some questions are obvious:

- What are the policy implications of this statement if it is a widely-held employer perception?
- What are the implications if it is indeed "true"?
- Are the implications such that the issue should be studied in depth, i.e., which programs meet which needs of which employers and which students?

If further research is warranted, one aspect of that research should be a study of student perceptions as compared to employer perceptions.

* * *

Animal Health Technicians: A Survey of Program Graduates and of Veterinarians. Richard B. Barsaleau and Henry R. Walters. Sacramento: Consumnes River College, March 1977, 16 pp. (ED 136 891)

DESCRIPTIVE ANNOTATION:

Consumnes River College wished to assess the impact of its two-year Animal Health Technician (AHT) program. Two studies were conducted to investigate the employment status and earnings of AHT program graduates: a survey of the graduates and a survey of local veterinarians, the employer group most likely to hire AHT graduates. A question of special interest addressed only to veterinarians asked whether graduates of any accredited AHT programs were "accepted" by the majority of local veterinarians.

At the time of the graduate study, three classes of trainees had been graduated and 68 students had received A.S. degrees. Of these, 47 responded to a mailed questionnaire (a response rate of 69%): 44 were female, 34 were unmarried, and the age range was 20 to over 35 with 34 under 25. Although development of the questionnaire is not discussed nor is the instrument appended, a list of the topics surveyed is provided. Included were employment status, job stability, and earnings. The report included the following findings: 1) 33 or 70% of the respondents were employed as AHTs, 14 or 30% were employed in related fields and one was unemployed by choice; 2) 15 AHTs out of 22 tallied on this issue were spending 25% or less of their time in front-office duties, clerical work as opposed to animal care work. The data are not statistically analyzed.

The second survey was mailed to 139 licensed California veterinarians (most in the Sacramento Valley); 71 responded, yielding a response rate of 51%. Sixty-two of the respondents employed animal health technicians, of whom 27 were graduates of an accredited AHT program, 34 had been trained on the job, 1 trained in a high school Regional Occupational Program, and 5 trained in proprietary schools. The authors state that the practice of on-the-job training is diminishing as more trained AHTs are becoming available. The development of the survey questionnaire is not described nor is the instrument appended, but issues covered by the survey are listed.

Results discussed include the following:

- Thirty-seven responding veterinarians indicated a willingness to provide Work Experience Stations for AHT students.

- From 47 to 60 veterinarians checked training needs in the areas of identification of animal breeds, laboratory techniques, reception procedures, and hospital safety.

- Some respondents commented, "All the Consumnes people I have met seem quite well informed regarding specific practices and their modes of operation" and "The only real problem I have seen is overconfidence which can lead an AHT to give misinformation to a client . . . ."

The study concludes: "Consumnes River College graduates are making their marks and are finding willing employers who will use their training and talents in a legal and ethical manner."

The surveys were an in-house project conducted by the AHT Program Director, R. C. Barsaleau, D.V.M., and H. R. Walters of Career Education/Institutional Research, both of Consumnes River College.

EVALUATIVE COMMENTS:

The major purpose of this study was to determine whether veterinarians in the Sacramento Valley area were accepting graduates of accredited AHT programs. As most graduates of Consumnes River College's program were employed as AHTs and surveyed veterinarians gave a range of positive responses concerning the programs, a degree of acceptance can be inferred. How much is not clear since issues such as possible response bias are not discussed. The study has greater potential than was realized, however, or at least than was reported: although some responding veterinarians were employing program graduates and others employing technicians who had received their training in other ways, no comparative data are reported.

Because the AHT program is not described, nor is development of the questionnaire described or the instrument appended, results of the study cannot be applied to other AHT programs in other areas nor can the study be replicated from the information given in the report.

* * *

An Assessment of Benefits Derived from Membership in a Vocational Student Organization in the Vocational, Technical and Adult Education System. Dennis R. Collins. Menominee: Center for Vocational, Technical and Adult Education, University of Wisconsin--Stout, August 1977, 92 pp. (ED 145 234)

DESCRIPTIVE ANNOTATION:

The primary purpose of this study was to determine whether participation in vocational student organizations (VSOs) results in leadership ability, career growth, community involvement, and social development on the part of participating students. It was hoped that positive findings would lead to greater emphasis on VSOs in the total spectrum of vocational education curricula. Neither specific research questions nor hypotheses were stated.

Four populations were identified for this study: (1) state directors of vocational education; (2) advisors of VSOs; (3) Wisconsin postsecondary VSO members; and (4) highly participating Wisconsin VSO members. The first two groups were questioned about process and structure variables and so will not be considered further in this annotation. The VSO member sample consisted of 15% of postsecondary members of thirty chapters of VSOs in Wisconsin including the Wisconsin Office Education Association, Distributive Education Clubs of America (DECA), Vocational Industrial Clubs of America, Wisconsin Association of Health Occupations, and Wisconsin Home Economics Related Student Organization. The response rate was 56% of the sample. The sample of highly participating VSO members consisted of 33 DECA members attending the Wisconsin DECA Junior Collegiate Career Development Conference in Madison in March 1976.

Written questionnaires were developed for this study and samples are appended to the document. The questionnaires were mailed to VSO advisors who were instructed to administer them as randomly as possible to 15% of the members. Students used a 5-point Likert-type scale to rate the benefits of VSOs in terms of certain outgrowths:

- leadership characteristics--ability to speak effectively, to make decisions, to exercise creativity

- career growth--pride in work, awareness of job qualifications, understanding of the effects of career choice on life style

- community awareness--involvement in political activity and social affairs of general interest

- social development--teamwork participation, positive self-image, ability to make and keep friends

The data are presented in frequency/percentage tables and in graphs. Data from the highly participating students and the randomly selected students are presented side-by-side for comparison purposes but no statistical analyses of differences have been made. Ratings of four or five (1 = none, 3 = moderate, 5 = significant) were considered to indicate that benefit was derived in terms of the characteristic rated.

Discussion of these findings are included: (1) forty-eight per cent of the participating members gave two leadership characteristics a rating of four or five, and a larger percentage gave such ratings to all other leadership characteristics; and (2) the responses of the randomly selected members were not as favorable as those of the highly participating members, with ratings of four or five being made by only 40-50% of the respondents for most of the leadership characteristics.

The author makes several recommendations for giving greater emphasis and support to vocational student organizations.

This study was conducted by a graduate assistant at the University of Wisconsin--Stout, Center for Vocational, Technical, and Adult Education--pursuant to a grant or contract with the Wisconsin Board of Vocational, Technical, and Adult Education.

EVALUATIVE COMMENTS:

Although the stated purpose of this study was to empirically investigate claims regarding the benefits of vocational student organizations, the data collected toward that end were strictly opinions of students. No justification for the assumption that students have the ability to assess and report those benefits accurately was given. Further, since the researcher did not randomly select members, it is not clear that the respondents to the questionnaire constituted a random sample of VSO members. For these reasons alone, it is difficult to come to any conclusions about the "actual" benefits of participation in VSOs.

The rating scale used is positively biased. It is different from most Likert-type scales in that the left endpoint is "none" and every other point is positively defined, whereas the usual scale is symmetrical with two or more negative points, a zero point, and two or more positive points. How respondents interpreted this scale is not clear. Further, although the author interpreted ratings of 4 or 5 to indicate a derived benefit, laws of probability predict that 40% of respondents would indicate a benefit derived (since, given five choices, random selection would result in each choice being selected 20% of the time). The author provides no rationale for his assumption that positive ratings by 48% or more of the respondents is different from chance expectation and for the assumption that it indicates VSOs as effective in leadership development.

The analysis of the data was inadequate. Although the author compares responses of randomly selected members and highly participating members, he uses no statistical techniques to determine whether differences in responses were different from those expected by chance. A statistical analysis such as a chi-square could have been used to advantage. In addition, a more serious problem exists. It is possible that observed differences between the two groups are functions of "self-selection" rather than of intensity of participation in a VSO. It is possible that factors causing students to be highly participating also cause them to develop leadership characteristics or to be better able to. These possibilities are not acknowledged.

* * *

Benefit-Cost Comparison of Vocational Education Programs. Statewide Evaluation of Vocational-Technical Education in Florida--Volume 2. Marshall A Harris. Tallahassee: Florida State University, Florida State Advisory Council on Vocational and Technical Education, 1972, 118 pp. (ED 074 223)

DESCRIPTIVE ANNOTATION:

The general purpose of this study was to determine whether vocational education in Florida has sufficient economic payoff to be considered a favorable medium for investing both public and private (student) resources. Methodologically, it builds on and improves upon two previous cost-effectiveness studies conducted in Florida. Three questions are addressed:

- Do vocational education programs in Florida have positive benefit-cost relationships?
- Do benefit-cost relationships between programs vary and do these relationships vary from student to student?
- Can the results of a benefit-cost analysis be useful to educational planners and decision-makers and to individuals anticipating enrollment in vocational education?

The population included persons who either completed training or left early during the period from August 1968 through September 1971. The state was divided into four geographic regions; and two Area Vocational Centers were selected from each of the regions, with inclusion based on enrollment and program factors. When a random sample of former students had been selected, questionnaires were mailed. Three hundred eighteen usable questionnaires were collected from the 820 mailed, a response rate of 39%. Responses from engineering students were excluded from the study as were those from former students with no training-related job experience. A table indicating numbers of usable returns and reasons for nonusability by vocational programs is provided.

The mailed questionnaire asked 16 general questions as well as specific questions about each job held (title, earnings, etc.). Portions were adapted from a questionnaire developed and used by other researchers.[22] The questionnaire is appended.

Both public and private costs and benefits are analyzed, and technical aspects of the analyses are discussed in the body of the report and in appendices. Chi-squares, Scheffé tests, analysis of variance, and multiple regression are used to analyze the data. A benefit-cost planning model is presented as well.

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[22] Jacob J. Kaufman, Ernst W. Stromsdorfer, Teh-Wei Hu, and Maw Lin Lee. A Cost-Effectiveness Study of Vocational Education: A Comparison of Vocational and Non-Vocational Education in Secondary Schools. Report to the U.S. Office of Education, Washington, D.C., March 1969. University Park: Pennsylvania State University, 1969.

Among the six "most cogent findings and conclusions" discussed are (1) ". . . on the average, society will recoup its average investment of $1,716 per student in 1.3 years and on the average, a student will recoup his average investment of $2,411 in 1.9 years" and (2) "On both public and student investments, nonsecondary students had higher rates of return than did secondary students."

EVALUATIVE COMMENTS:

This report is notable for being very detailed. Cost-benefit analysis is a complex technique, and detail is a necessary prerequisite for accurate assessment. However, there are pitfalls of this type of analysis and findings should be viewed in light of those pitfalls.[23]

A strong point of this study is that a questionnaire in a previous study was adapted. If a knowledge base about vocational education is to be built, some comparability in data collection and analysis are necessary. The repeated administration of the same, or at least similar, instruments is one method of achieving this comparability.

* * *

Comparative Analysis of Post Secondary Occupational and Educational Outcomes for the High School Class of 1972. R. Reid Creech, Norman E. Freeberg, Donald A. Rock, Kenneth M. Wilson, and Kan-Hua Young. Princeton: Educational Testing Service, May 1977, 465 pp. (ED 139 845)

DESCRIPTIVE ANNOTATION:

This report is the result of a project having two objectives: "to effect a partial evaluation of the effectiveness of vocational education as compared to academic and general high school programs" and "to develop information useful for program planning specialists involved in vocational education." To accomplish these objectives, various aspects of "the current[24] status and activities of the class of 1972" were investigated, including educational activities, job changes, duration of employment, job satisfaction, and weekly earnings (Chapter 2). Also investigated was "the realization of plans and aspirations" (Chapter 4). Some chapters of the document describe the social makeup of the high school class of 1972, the variables used in the study, and the methods of analysis; others discuss "nonresponse and related concerns" and "Where do we go from here?" The major findings of the study are summarized in Chapter 5.

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[23] See Darcy, Perspective for a discussion of some of the pitfalls.

This study is based on data collected in the National Longitudinal Study of the High School Class of 1972, one of a series of National Longitudinal Studies of Educational Effects sponsored by the Department of Health, Education, and Welfare. Based on both the original set of data and on the first 18-month follow-up, it "represents the first in-depth investigation of what has happened to the Class of 1972 since its graduation, with special emphasis on educational and vocational outcomes."

Nearly 3,000,000 students graduated from high schools across the nation in 1972. About 18,000 of these students were selected, according to a carefully designed and executed sampling plan, to participate in the National Longitudinal Study of the High School Class of 1972.

The development of the first follow-up of questionnaires (FFQ), which was used to collect much of the data discussed in this report, is not described in this document. A form of the questionnaire is appended however and the questionnaire items are discussed. Nonresponse and related concerns are also discussed.

The data analysis techniques employed in this study are thoroughly described. Multiple point-biserial regression analysis was used for comparisons between two groups, and multiple discriminant analysis was used for comparisons involving three or more groups. An econometric model using a simultaneous two-equation system was used to examine the interaction between college attendance and work participation. Five structural (path) analytical models were built and tested in an effort to assess what underlies decision making in the occupational-educational aspiration area, post-high school educational progress.

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[24] The time period referred to as current roughly represents May 1972 - January 1974.

Among the results discussed in the "Summary of Major Findings" are these:

- At the time of the first follow-up survey, 64% were employed and 8% were out of work.
- The employment rates for graduates of various curricula were vocational: 77%; general: 68%; and academic: 56%.
- The homemaking rates were vocational: 40%; general: 36%; and academic: 15%.
- Earnings were similar for blacks and whites but much higher for males than for females.
- On the average, vocational graduates worked a greater number of weeks from October 1972 to October 1973 than did graduates of other curricula.

The project investigators were from the staff of Educational Testing Service. The project was conducted pursuant to HEW Office of Planning, Budgeting, and Evaluation Contract No. 300-75-0312, a response to Office of Education RFP 75-60.

EVALUATIVE COMMENTS:

Time and space do not permit a thorough analysis of this document. It is notable in that the variables and methods of analysis are described in detail; however, the reader is cautioned to thoroughly review both this document and other documents describing the National Longitudinal Study of the Class of 1972 before accepting any of the results listed here.

* * *

A Comparative Study of the Occupational Achievement of Vocational and Non-Vocational High School Graduates in the State of Arkansas. Dean C. Andrews and Lawrence H. Roberts. Magnolia: Educational Planning and Evaluation Services, December 20, 1974, 131 pp. (ED 112 207)

DESCRIPTIVE ANNOTATION:

This study was a response to the concerns of taxpayers and decision-makers in regard to the effectiveness of education. Specifically, it was conducted to acquire feedback information to be used in improving the vocational education programs in Arkansas. A cost-benefit study was considered but rejected because, among other reasons, the cost would have been prohibitive and too many methodological issues are yet to be refined. Instead, this study sought to compare the occupational achievements of students who were enrolled in vocational education with those of students who were not so enrolled with respect to their (1) occupational status, (2) educational status, (3) earnings, (4) job satisfaction, and (5) other related factors.

The study, conducted in 1974, had as its population the 1970 graduating classes of eight Arkansas public high schools. Three samples were selected: (1) those who had had two semesters of vocational classes; (2) those who had had four semesters of vocational classes; and (3) those who had had no vocational training. In order to ensure that the third group was comparable to the first two, those graduates who had had grade point averages (GPAs) above 2.25 and had planned to go to college were eliminated. A total of 1749 of the 2597 graduates of the eight schools were sent questionnaires yielding an overall sample of 67%. Three mailings were used in an attempt to reach as many graduates as possible; the final response rate was 36% of the sample (24% of the population). Tables indicating responses to the separate mailings and response rates by sex, race, GPA, and vocational training are provided.

A preliminary questionnaire was developed and pilot-tested for clarity and reading level with eleven 1973 graduates of one of the high schools used in the study. Those graduates made suggestions that were incorporated into a revised form subsequently administered to five more graduates. In addition, several professional educators critiqued the preliminary questionnaire. A copy of the final form is provided in an appendix. The data from school records and the questionnaires were summarized on predesigned tables and coded on computer cards. Most of the data analysis is descriptive--summary tabulations of frequencies and percentages. Chi-square analyses were used to determine whether statistically significant differences existed between categories.

Topics discussed in three chapters include the occupational activities of the vocational graduates, the vocational graduates' evaluation of their training, and a comparison of occupational achievement of the four-semester vocational graduates and the nonvocational graduates. A subsequent chapter summarizes the results and provides conclusions and recommendations.

Chi-square analyses were done to compare the vocational and nonvocational groups on the basis of sexual composition, racial composition, and grade point average. The only statistically significant difference between the groups was in grades: a higher proportion of vocational graduates had GPAs above 2.00. The authors acknowledge that the results reported, of which the following are a sample, should be interpreted in light of this grade difference:

- There are no significant differences in occupational status between graduates of each group (i.e., no significant difference in proportions of those working full-time, of those attending college, etc.).

- A greater proportion of vocational graduates are employed in trade and industrial areas.

- There are no significant differences in the degree of job satisfaction expressed by the vocational and nonvocational graduates.

- There are no statistically significant differences in earnings.

Based on differences in occupational status between vocational students with two semesters of vocational courses and those with four semesters, the authors conclude that two years of vocational training is desirable for those who plan to work after high school. Based on the lack of relationship between type of job and type of training, however, they recommend that local education agencies study the relationships of their offerings to the job market and/or implement a vigorous placement program. Still, they conclude, vocational graduates have a greater chance than nonvocational graduates of finding full-time work they consider closely related to their high school training.

This study was conducted by two members of "Educational Planning and Evaluation Services," based in Magnolia, Arkansas.

EVALUATIVE COMMENTS:

This study is notable for at least three reasons:

- The authors indicate that they chose a methodology in light of their purpose.
- The data-collection instrument was pilot-tested.
- Differences between groups were statistically analyzed.

Because graduates who had four semesters of vocational training had a higher occupational status than those with only two semesters, the authors conclude that four semesters are better than two. They failed, however, to consider the possibility of a self-selection factor. Perhaps those students who completed four semesters have other qualities helping them achieve a higher occupational status than those with only two semesters. There are a number of ways this question can be explored in further research.

* * *

A Comparative Study of the Occupational Achievement of Vocational and Non-Vocational High School Graduates in Texas. John A. Laska and Jau-Woei Chiou. Austin: Department of Cultural Foundations of Education, Center for International Education, University of Texas at Austin, June 30, 1973, 183 pp. (ED 118 944)

DESCRIPTIVE ANNOTATION:

The primary purpose of this study was "to determine whether there were any real differences in occupational achievement between the high school graduates who had been enrolled in vocational education programs and the graduates who had not been enrolled in these programs." It was intended to respond to the "legitimate right [of concerned and interested taxpayers, legislators, and political leaders] to inquire about the efficacy of . . . large expenditures in preparing students for gainful employment in the labor market." Further, the findings of this empirical research were intended to be used for continuing improvement of vocational education programs.

The literature review section cites the Little review[25] as well as some specific studies. "In summary, a review of existing research indicates that earnings, length of employment, job satisfaction, occupational status, and occupational mobility were commonly used as the indices of occupational achievement. Some other variables were found relevant in accounting for these indices of occupational achievement. They were sex, ethnicity, academic achievement, social origin, college attendance, community differences, and vocational education. The findings obtained from existing research were extremely useful in developing the conceptions and in deciding the scope of this study."

For this study, vocational students were defined as those who had completed two credits in a school year in a vocational program. Nonvocational students were matched to vocational students according to sex and accumulated scholastic ranking. Complete information on the sampling procedure is provided. The population consisted of students who had graduated in 1970 from 17 public high schools in 5 independent Texas school districts. A letter and questionnaire were sent to 3,045 graduates in August 1972. Follow-up mailing was sent in September. In all, 1058 (35%) of the 3,045 graduates responded to the questionnaire, 502 (16%) could not be reached, and 1485 (49%) either indicated a refusal to cooperate or did not return the questionnaire by the October deadline. Response rates by schools are tabled as are characteristics of the sample.

A survey questionnaire was designed to collect data from which to derive six indices of occupational achievements. Three indices concerned income--accumulated income, monthly earnings, and hourly rate--and three concerned employment--weekly working hours, months of employment, and actual job length. In order to account for possible spurious, but statistically significant, relationships, several control variables were introduced, including sex, community, ethnicity, social origin, marital status, college attendance, and academic achievement. Other possibly relevant variables, such as quality of teaching personnel, teaching facilities, work motivation, personality traits, and labor-market situations, were deemed beyond the scope of this study.

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[25] J. Kenneth Little. Review and Synthesis of Research on the Placement and Follow-up of Vocational Education Students (Columbus: The Center for Vocational and Technical Education, The Ohio State University, February 1970).

The questionnaire was pilot-tested extensively to ensure that it was comprehensible. Item analyses were performed to eliminate redundant items. The survey questionnaire is appended as are coded raw data.

The two major statistical techniques used in this study are analysis of variance and multiple regression analysis. Factor analysis is used to interpret the interrelationships among different indices of occupational achievement. The rationale for each specific analysis used is thoroughly discussed and several tables of data are provided. Results of preliminary analysis and subsequent analyses are thoroughly discussed with accompanying tables.

Among the conclusions and policy implications (based on 894 respondents) provided in the final chapter are these:

- 244 completed two or more years of college, and 157 attended college from 4 to 18 months during the 27 months after high school graduation. For those students then working, secondary vocational education was not an important variable in initial employment when community, sex, and college attendance were controlled.

- The effects of secondary vocational education were statistically significant (.05 level or beyond) in accounting for the accumulated income and actual job length of the 493 noncollege workers of both sexes, the months of employment of male noncollege workers, and the weekly working hours of female noncollege workers in the Austin-San Antonio area, but not in Houston.

- Community factors seemed to relate to the operation of secondary vocational education in different ways.

- Beneficial returns of secondary vocational education were definitely real and substantive in terms of yearly accumulation.

The researchers are members of the Department of Cultural Foundations of Education, Center for International Education, University of Texas at Austin. The study was conducted pursuant to a contract with the Department of Occupational Education and Technology of the Texas Education Agency.

EVALUATIVE COMMENTS:

This is a complex study with several notable features. Rationale, based in part on a literature review, for the chosen variables was provided; the survey instrument was pilot-tested; the data analyses are thoroughly described; and the raw data are appended to the report. It is one of the few studies in which vocational students are compared to nonvocational students. The students were matched according to sex and scholastic ranking. However, the authors do not acknowledge the limitations of matching as a tool in quasiexperimental research.

* * *

The Contributions of Vocational Education, Training, and Work Experience to the Early Career Achievements of Young Men. John T. Grasso. Doctoral dissertation presented to the Faculty of Educational Development of The Ohio State University, Columbus, July 1975, 167 pp. (ED 113 537)

DESCRIPTIVE ANNOTATION:

The author states "Much of the decision making underlying vocational education legislation and expenditures occurred in the absence of adequate information." He goes on to say that although research has been done and some of it is encouraging in its diversity of perspectives, the policy relevance of the research "has been circumscribed by limitations inherent in the design of many of the studies, or as a result of conceptual or methodological difficulties, often compounded--if not caused--by a lack of adequate data." Other limitations are discussed as well.

This study was conducted to contribute to "improvement in the formulation of public policy on the education and training of youth . . . by reviewing completed research and by extending and refining it with both improved data and methods of analysis." The empirical aspect of the study seeks to determine how youth from different high school programs compare in the following areas:

- knowledge of occupations
- attitudes toward the adequacy of their preparation for work

- participation in post-school training and learning activities
- skill level
- wages earned
- job satisfaction
- unemployment experience
- long-run career prospects

Except when noted, the conclusions drawn in this study are based on a subset of the National Longitudinal Surveys (NLS) sample: those young men not enrolled in school at the time in question who had completed high school but not even a year of college. "A national probability sample of over 5,000 males between the ages of 14 and 24 was interviewed in the last quarter of calendar year 1966 and annually thereafter through 1971; information collected through 1969 was available for this study." The young men were divided into four curricular categories: college preparatory, general, vocational-commercial, and vocational-other (referred to as vocational).

This study is based on the personal interviews and the 1968 special mail survey conducted as part of the National Longitudinal Surveys. The instrumentation is described in various NLS documents. All analyses in the study are based on data statistically weighted to allow reliable comparisons between black and white youth. Further delimitation of the youth on the bases of vocational program studies or extent of study were not possible; however, it was possible to statistically control for the following demographic variables: socioeconomic status, scholastic aptitude, and race. Other control variables used are price level and demand, military service, residence at age 14 (rural farm, rural non-farm, small city, medium city, and large city or suburb), and, for the in-school youth analyses, grade placement and work experience (if any). All the variables used, independent and dependent, are thoroughly described.

The results relative to the eight factors itemized in the first paragraph of this annotation are described in detail with several summary tables. The following are included among the findings:

- Neither vocational nor vocational-commerical students possess greater occupational information than general track students.

- Vocational graduates do not consider themselves better prepared for the world of work than general graduates.

- Many graduates of the various curricula sought further training--college, preprofessional or technical; commercial, managerial; vocational, skilled manual.

- There is no indication that vocational graduates obtain jobs with higher skill requirements than other graduates, but those with post high school training (excluding college) obtain jobs with higher ratings.

- In terms of wages, white vocational students benefit more from post high school training (excluding college) than other white students. However, there were no wage differences found among black youth from different curricula.

- Job satisfaction results reflect the earnings results reported in the preceding item for white youths, but again no curricular differences were found among black youth.

- No conclusions on unemployment experience with respect to curricular differences could be drawn from the data.

- College preparatory students and white commercial graduates have the most favorable long-run career prospects in terms of earnings; however, among black youth, the positive differential for college preparatory students may be nonsignificant.

The final chapter presents conclusions and policy implications derived from the study. There are at least four major implications for secondary school policy makers:

- Schools need to impart more information regarding careers in general and about the role and importance of postsecondary school training and learning opportunities.
- The accessibility of postsecondary training programs should be increased.
- Additional training for black youth must be promoted, but efforts must be accompanied by affirmative action labor-market policies.
- Specific types of careers best served by each curriculum should be ascertained and programs modified accordingly to serve the needs of youth and society.

This study was undertaken, in part, to fulfill requirements for the author's doctoral degree. He spent five years working on the National Longitudinal Surveys project while completing his doctoral studies.

EVALUATIVE COMMENTS:

Several limitations of the curriculum variable are acknowledged by the author. Occupational programs, for example, auto mechanics and agriculture, are not distinguished; student reports of their curricula were not confirmed; the extent or intensity of vocational study undertaken in high school was not noted; and students who took a "general" curriculum with a practical arts emphasis (for example, general business courses) are not distinguished from those who took a general curriculum without such emphasis. In spite of its limitations, however, this study with its statistical controls of several variables is an improvement over several less sophisticated studies.

* * *

A Decade of Feedback Information from Harcum Graduates: 1968-1977. Boris Blai, Jr. Bryn Mawr, Penn.: Harcum Junior College, August 1977, 5 pp. (ED 142 270)

DESCRIPTIVE ANNOTATION:

The overall purpose of Harcum Junior College's Institutional Research Reports is to provide information for "effecting improvements in existing practices." This document is a report of their self-evaluation program, ongoing since academic year 1967-68, designed in consonance with Harvard professor David Reisman's statement ". . . a college must be tested by its products, the most obvious product being the alumni." Specifically addressed is the extent to which the College has achieved its objectives "[to] provide transfer programs paralleling those offered in the first two years of four-year collegiate programs of study," and "[to] offer career preparation, equipping individuals to become contributing members of the working world."

From 1968 through 1977, a questionnaire was mailed each summer to that year's graduates. The average response rate was 52%. Although the questionnaire was not discussed, this report summarizes the data collected over that decade.

Among the results presented are these:

- The lowest percentage of those accepted for transfer to advanced standing was 30% in 1976; the highest, 62% in 1973.
- The lowest percentage receiving full-time employment was 20% in 1973; the highest, 52% in 1969.
- In response to the statement ". . . Harcum prepared me for the field I have chosen," 89% responded "very helpful" or "somewhat helpful"; only 11%, "not helpful."

Among the interpretive comments made by the author are: "One reason for the decreasing trend in transfer to four-year colleges/universities may be that more Harcum graduates are entering occupational fields that do not require baccalaureate preparation," and "Some graduates do not look for work until the fall following graduation, and therefore the percentages reported are conservative estimates of the employment status of Harcum graduates." The general conclusion of this decade report is "the articulation of its graduates into the community at large . . . [evidences] a record of effective results."

This report was written by the Director of the Harcum Junior College Office of Institutional Research.

EVALUATIVE COMMENTS:

This is a very brief report, meant for internal use at the college. As such, it provides policy makers and staff with a descriptive overview of some outcomes of Harcum's blend of liberal arts and an occupational program. However, the report gives the reader insufficient information for judging the credibility of the data. Was the questionnaire valid and reliable? What was the extent of the nonresponse bias?

A further problem is that no standards are provided against which to compare the reported percentages. How is a finding that 11% of respondents found the college to be "not helpful" in preparing them for their chosen fields useful to policy makers? Is that percentage so small as to be not worth considering or so large as to challenge the college to initiate changes aimed at improving its occupational preparation programs? If it is not useful information, one may question the inclusion of the question in an evaluation study.

* * *

The Effectiveness of Vocational and Technical Programs: A National Follow-up Survey. Gerald G. Somers, in collaboration with Laure M. Sharp and Thelma Myint and with the assistance of Susan Fernbach Meives. Madison: Center for Studies in Vocational and Technical Education, University of Wisconsin, 1971, 282 pp. (ED 055 190)

DESCRIPTIVE ANNOTATION:

The basic purpose of this study was to provide some measures of the effectiveness of vocational-technical education, that is, formal instruction aimed at preparing youth and/or adults for initial entrance into an occupation or for advancement within an occupation (excluding advancement for which baccalaureate or postbaccalaureate education is a prerequisite.)

At the time of the study there were no national data available for an evaluation of the effectiveness of vocational education; thus the study was undertaken to fill that void.

The universe, the sampling techniques, the study samples, and nonresponse bias are thoroughly described and several tables are included. Basically, a stratified random sampling technique was used, resulting in samples of graduates from high school vocational programs; graduates from postsecondary vocational schools (presumably vocational-technical institutes); graduates from vocational programs of junior colleges;[26] graduates of high school academic programs; and dropouts from high schools, postsecondary schools, and junior colleges.

Samples of 1966 graduates were surveyed by mail in 1969. Questionnaires were mailed to 7327 graduates of 194 secondary schools, 3461 graduates of 54 postsecondary schools, and 2591 graduates of 64 junior colleges. The samples of dropouts obtained were too small to include in most of the evaluative analyses, but some descriptive data are provided.

A random sample of nonrespondents was drawn and follow-up telephone interviews were conducted so nonresponse bias could be assessed. There did not appear to be any consistent, significant differences; however, it is noted that the respondents and sampled nonrespondents are not evenly distributed among the program areas.

The development of the mailed questionnaires is not discussed; they are appended, however. The questionnaires had from 47 to 70 questions, with multiple-choice and open-ended items. The data analysis consisted of cross-tabulations of percentages, chi-squares, and regression analyses.

Findings of the study are discussed in six chapters:

- The Educational Experience and Student Attitudes
- Post-Vocational Employment Experience
- Post-Vocational Wages and Earnings

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[26] It is not clear whether community colleges are included, but the author cites a report prepared by the Bureau of Social Science Research giving details on characteristics of included junior colleges.

- Post-Vocational Educational Experience
- Evaluation of the Costs and Benefits of Vocational Education
- Conclusions and Policy Implications

Several tables are provided throughout the chapters and in an appendix. Seven "highlights" are provided in the front matter of the document, and each chapter has a summary conclusion.

Conclusions and policy implications, in the form of a discussion of the significance of school level, geographic region, urban vs. rural setting, program area, demographic characteristics, and grade point averages as influences on attitudes, labor market performance, and further educational experience are presented in the final chapter.

Several summary observations are included with their implications:

- Vocational programs at different school levels serve different clientele (because of variances in student backgrounds and attitudes) and different training purposes, despite similarity in occupational program titles.
- A relatively large proportion of junior college agricultural, technical, and health program graduates and high school distributive and trade and industry graduates move directly from graduation to a full-time job or further education, whereas graduates of other programs require longer job-search times.
- Junior college vocational graduates in general experience greater economic success with more satisfactory employment and better earnings than other graduates, both vocational and academic.[27]
- With the exception of agricultural programs, economic benefits of vocational and technical education are higher for graduates in the West,

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[27] The authors acknowledge that not all junior college programs are cost-effective; that the cost data used are from other studies; and that junior college programs are not necessarily the best choice for every student because of variance in interest, intelligence, and other qualifications.

Northeast, and North Central than in the South; and higher for urban and suburban graduates than for rural graduates.

- Males, older graduates, and married graduates enjoyed labor market experiences superior to those of females, younger graduates and unmarried graduates. One implication is that there is need for a longer period of general education preceding specific vocational choices.
- The relation of job to training does not appear to influence levels of employment and earnings. Actually many students are able to earn more by moving out of their field of training upon labor-market entry.
- This may support the view that general vocational training and training for clusters of job skills are preferable to specific training and training for specific jobs.
- Although occupational program area is of some importance in the labor market experience of graduates, it is not as important as traditionally believed.

This research was funded by the Division of Adult and Vocational Research, U. S. Office of Education, Department of Health, Education, and Welfare. The senior author is a professor at the University of Wisconsin; his collaborators are staff of the Bureau of Social Science Research, and the junior author is a graduate research assistant at the University of Wisconsin.

EVALUATIVE COMMENTS:

This study is too complex to permit a thorough critique. The authors acknowledge some limitations of the data collected and the data available, as well as noting that, in many instances, data are unavailable to distinguish among alternative reasons for some findings. For example, did women as a whole earn less because of overt discrimination or because they did not aspire to full-time jobs following their vocational training?

Although the report is lengthy, some information necessary for assessing the study and relating its findings to other studies is lacking. For example, what exactly is a graduate of a postsecondary vocational school? What specific methods of statistical analysis were used? How was the questionnarie developed?

* * *

Employer Satisfaction with the Skills of Vocational Education Graduates in North Dakota. Larry L. Smiley. Grand Forks: Bureau of Educational Research and Services, University of North Dakota, August 1976, 81 pp.

DESCRIPTIVE ANNOTATION:

One of the goals of North Dakota's State Plan for Vocational Education specifies the percentage of completers who will be placed in the field in which they have been trained, or in a related field. This study was done to aid that effort by ascertaining how satisfied employers were with the completers they had hired and in what areas the vocational programs needed to be improved.

The initial data base comprised all secondary and postsecondary sites in North Dakota with at least five vocational programs. Personnel in each program identified three major employers of program graduates and one or two self-employed graduates. The 482 names identified constituted the survey sample. From 226 employers indicating a willingness to participate in a personal interview, 191 provided data. A questionnaire (appended to the document) was developed for use in the personal interview, which took approximately 30 minutes.

Twenty-one questions were asked, several with multiple parts. Some of the questions were in a rating-scale format, some in the form of checklists, and others open-ended or requiring a yes or no response. They addressed issues of general satisfaction with employees; degree of specific knowledge, skills, and abilities employees possessed; and ways of improving training.

Findings are presented in the order that questions appear on the interview schedule. Responses to each question are summarized in tabular form along with a brief discussion.

It is left to the reader to draw conclusions. The reported findings include the following:

- Fewer than five per cent of the responding employers rated the vocational education system below average.
- 73% of employers rated manual job skills above average and 47% ascribed the same rating to practical job knowledge.
- A specific employer comment is "Most of the vocational education graduates come to work with skills well developed, but the training programs have failed to offer the students anything that prepares them for moving into supervisory or managerial positions."
- Nearly 90% of the employers rated the vocationally trained employee high to average in comparison with those without the vocational training. Many could not make a comparison because certification requirements for entry-level job placement prevented a non-vocationally trained individual from being hired.
- Several "needed areas of improvement for job applicants" were listed. Heading the list (in order of frequency of response) were attitudes toward work and appearance. Also listed were courses that vocationally trained students should have, with courses in Communication, Speaking Effectively, and Work Orientation at the head of the list. Need for a course in Success in Marriage was listed by 88% of the respondents.
- Many employers contact schools to recruit qualified employees. Some (including out-of-state) schools are regularly contacted because such individual schools have gained a reputation for quality--good skill development, etc.
- A list of some of the general comments employers made about vocational education programs and the graduates is provided. Among the comments are: "Realities of position need to be made clear to the students," and "Secretaries trained

as medical secretaries are less capable than those with no specialized training."

- Several employers expressed the opinion that high school graduates are sold a bill of goods when told they have a saleable skill after their high school vocational training, that the intent of high school vocational training is to introduce young people to vocational areas and materials of those trades, not in any sense to provide a terminal degree. One employer said, "If this high school level training has helped a young person to clarify vocational interest which can be furthered by additional schooling, it has served an excellent purpose."

EVALUATIVE COMMENTS:

This type of study can alert vocational planners to employers' perceptions of vocational education, thus indicating areas where the system is meeting their needs, where improvements are needed, and what kinds of changes may prove beneficial. It gives direction for more intensive investigation. A careful reading of the report is necessary, however, because in some instances the author notes that respondents' verbal comments contradict the ratings. For example, employers' ratings of students' attitudes toward work do not indicate that this is a serious problem, whereas employers' comments indicate that it is.

It is unfortunate that the findings are not broken down by level of schooling (secondary vs. postsecondary) and that information about the content of the various vocational curricula was not compiled. Although this study was not intended to be generalized to programs outside North Dakota, such information would be helpful to those who might wish to use the study to suggest areas for further exploration within their own systems.

* * *

"A Follow-up Study of Former Occupational-Technical Students at Virginia Community Colleges." Edith H. Carter. Paper presented at the Annual Regional Research Conference for Secondary and Post-Secondary Vocational Education Personnel, April 17, 1976, 10 pp. (ED 136 899)

DESCRIPTIVE ANNOTATION:

It is stated in this report "The planning for expansion of program operation should be based upon awareness of information about students and potential students, their occupational needs, and also the activities of former students after they leave the community college." This study was designed and conducted to provide comprehensive and accurate information about former students of Virginia community college occupational-technical programs. Explicit, major objectives of the study were as follows:

- To identify selected personal and demographic characteristics of former students in occupational-technical programs
- To identify postcollege activities of former students
- To study the attitudes of former students toward their community college experience and current employment
- To study patterns of student retention and withdrawal
- To examine differences among graduates and nongraduates and among the several types of graduates in terms of their characteristics, postcollege activities, and personal evaluations of college experience and employment

The population consisted of all students who had been enrolled in a Virginia Community College occupational curriculum at any time from the fall of 1966 through the fall of 1969. A total of 11,623 former students from 13 colleges were identified. After an initial questionnaire and three follow-ups were mailed, 61% of the population (not including the 12% undeliverable) returned usable responses (73% of the graduates and 56% of the nongraduates).

Two instruments were used to collect data: The "college data form" was used to collect demographic information and the "student questionnaire" was used to collect information about postcollege activities, employment, and evaluation of college experiences. The student questionnaire was designed to fulfill the stated objectives of the study, but no further discussion of its development is provided, nor is it appended.

Responses to the questionnaire were entered onto computer tapes by optical scanning to obviate the possibility of keypunch errors. No statistical analyses of the data are reported.

Two results reported are (1) that almost three-fourths of the [respondents] were working full-time in jobs related to their community college curricula and (2) that both graduates and nongraduates rated the quality of their college preparation superior or good in most areas with nine-tenths of them stating that they would recommend their community college to an individual planning to enroll in the same program.

This study was conducted/reported by the Director of the Office of Institutional Research, New River Community College.

EVALUATIVE COMMENTS:

This report is necessarily brief, because it was a conference paper rather than a final report of a study. Still, the credibility would be enhanced if more complete analyses of the data were presented. The relatively large response rate reported may be indicative of the advantage of follow-up mailings.

As in most of the studies annotated in this bibliography, there is some question regarding the validity of the survey instrument. For example, what assurance is there that former students who respond to a questionnaire from their alma mater, when asked if they would recommend it to other individuals, will respond honestly after thoughtful consideration? A pilot test in which respondents are questioned more thoroughly in a personal interview (and asked, for example, if they ever have recommended their college to another individual) is one way to assess the validity of the survey instrument.

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A Follow-up Study of Illinois Home Economics Job Training Programs. Final Report. Kathleen M. Howell and Joyce L. Felstehausen. Springfield: State of Illinois, Board of Vocational Education and Rehabilitation, Division of Vocational and Technical Education, Research and Development Unit, September 1971, 122 pp. (ED 059 379)

DESCRIPTIVE ANNOTATION:

This pilot study was designed to test the use of certain procedures and instruments for examining the post-high school employment experiences of graduates of Illinois Home Economics Cooperative Education Programs and to provide recommendations for leaders in the field. Both graduates and employers were surveyed. Questions asked on the graduate questionnaire concerned type and number of jobs held, reasons for leaving jobs, desirable and undesirable features of jobs, part- or full-time status, reasons for never being employed, and the value of the job training received. The employer/supervisor questionnaire asked how well the graduate was prepared for the job, how proficient the graduate was in important job-entry skills, and how the job training for that position could be improved. Both questionnaires included multiple-choice and open-ended questions.

Cooperative Gainful Home Economics teachers in 44 Illinois public secondary schools identified 691 home economics graduates of 1969 and 1970. The sample analyzed consisted of 188 respondents, a response rate of 27% (with non-deliverables assumed to be random, a response rate of 34%). Those graduates identified 110 employers of whom 75 returned questionnaires, yielding a response rate of 68%.

Both the graduate and the employer questionnaires were adapted from others developed and used previously by the senior author. After pilot testing for use in this study, revisions were made. The questionnaires are appended.

The results were tabulated according to sex, graduation year, and courses taken. Tables of frequencies, averages, and percentages are provided, but no further statistical analyses were made.

The following findings from the graduate questionnaire were included:

- 62% of the graduate sample were employed at the time of the study.
- 24% to 55% of those employed (varying with training area) were employed in their areas of training.
- 11% of the graduates had never been employed.

- 51% of the graduates indicated job satisfaction related to working with people, whereas 54% indicated dissatisfaction related to job-situation factors, such as specific undesirable tasks and working conditions.

- Graduates felt that, although they would have liked more employment experiences and instruction, their vocational programs had prepared them for employment, especially in getting along with others, using time and energy, and handling new or unpleasant situations.

Following are some of the findings from the employer/supervisor questionnaire reported:

- Job training contributed to employability traits, especially in areas of attendance, attitudes toward supervision, and cooperativeness.

- Personal factors such as initiative and honesty were entry-level skills considered important.

- Training should emphasize positive attitudes toward work, learning, and supervision.

Specific recommendations are made for the Program Approval and Evaluation Unit, the Special Programs Unit, and the Research and Development Unit. These range from recommendations that specific steps to implement the provisions of the State Plan be identified to suggestions that a comprehensive evaluation program include long-range investigations to determine relationships between crime and delinquency rates and job training (or lack thereof) for youth.

Both authors are from the Eastern Illinois University's School of Home Economics. The senior author, project director, is an Associate Professor whereas the junior author, principal investigator, is a research assistant. The study was conducted pursuant to a contract with the Illinois Board of Vocational Education and Rehabilitation.

EVALUATIVE COMMENTS:

The authors themselves question the validity of their results, since only 34% of the graduates who received questionnaires responded. They express concern that 35% of the mailed questionnaires were undeliverable by the post office, indicating lack of current address information even though follow-up is mandated.

One of the notable features of this study is its pilot test and appended questionnaire. Reliability and validity data are not given but it is noted that some item analysis has been done, indicating that the instruments will be refined for still further use.

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Follow-up Study of Machine Tool Technology and Building Construction Graduates: Evaluation Report. Wilbur Hall, Rodney Gray, and Arthur O. Berry. South Portland: Southern Maine Vocational Technical Institute, August 1975, 115 pp. (ED 124 746)

DESCRIPTIVE ANNOTATION:

This study was designed to determine how well the Southern Maine Vocational Technical Institute's Machine Tool Technology (MTT) and Building Construction (BC) programs are succeeding in their efforts to prepare well-qualified employees. Specifically, it sought to acquire the following information: (1) employment status of graduates, (2) employment sequence of graduates, (3) perceptions of the value of the MTT and BC programs held by graduates and employers, (4) upgrading and retraining needs, and (5) graduate and employer profiles for programmatic restructuring and development.

A questionnaire was sent to each of the 126 MTT and BC students from the classes of 1970, 1972, and 1974. A random sample of those graduates living within a reasonable commuting distance of Southern Maine Vocational Technical Institute were selected for personal interviews to supplement the questionnaire. Seventy-five graduates returned questionnaires and 38 of them were interviewed. Employers were interviewed when possible. The response rate was 63% for BC graduates and 55% for MTT graduates. A majority of the sample had received diplomas; the others, associate degrees.

The questionnaire, consisting of an "opinionnaire" and a checklist, was validated by use with a sample of graduates before being sent to the selected sample. Although personal information (name and address) was collected, graduates were assured that their responses would be kept confidential. The opinionnaire and checklist are appended.

The document provides extensive tables detailing responses to the survey instruments. Responses to many of the open-ended questions are listed as well. Results, in terms of percentages, are reported separately for MTT graduates and BC graduates, although no statistical analysis is provided.

Among twenty summary findings are the following:

- All graduates who responded were employed, with a majority working in the trade area for which they had been prepared or in one closely related to it.
- The majority had held only one job since graduation.
- 38.6% of the BC graduates and 65.7% of the MTT graduates had pursued further training or education.
- Respondents indicated general satisfaction with the quality of the instruction they had received, although attaching many suggestions for improvement in the curricula.
- Employers were generally satisfied with program graduates, although they were concerned "with continued program relevancy to the trade or occupational areas." Recommendations for program and study improvement are provided.

This study was initiated by the Southern Maine Vocational Technical Institute. The principal investigators were instructors at the Institute--one BC, the other MTT--employed full time for two months to conduct the study. Dr. Arthur O. Berry, whose professional identity is not reported, was responsible for the data analysis and the evaluation report.

EVALUATIVE COMMENTS:

The report gives sufficient information for replicating the procedures of the study. However, other information is lacking. The interview questions for the graduates and the employers are not described; although it is stated that the questionnaire was validated, the validation procedure and results are not described. Although the 100% employment rate of the respondents suggests a tendency for bias toward the employed, possible bias in the respondents is not considered. And finally, statistical analysis of the data was not done.

Although these insufficiencies may have minor impact for the intended audience--Southern Maine may conclude that their Vocational Technical Institute is doing a reasonable job of preparing well-qualified employees--it is injudicious for an expanded audience to draw any conclusions from this report, or even to determine whether the survey instrument would be useful for another institution. Without even minimal statistical data analysis to determine the probability of random differences in responses, on the basis of this survey it is risky even for Southern Maine to draw any substantive conclusions about policy or program changes needed.

* * *

Follow-up Study of 1969-1975 Graduates of the Division of Technology of New York City Community Colleges. Jeanne M. Gammel, Stanley M. Brodsky, and Richard L. Alfred. Brooklyn: New York City Community College, April 1976, 134 pp. (ED 121 396)

DESCRIPTIVE ANNOTATION:

The preface to this study states, "If the college of the future is to realize even a modicum of its potential, faculty and administrators will have to begin to pay as much attention to the outputs of instructional programs as to the number of students, buildings, and organizational structures." The study was designed to provide such output information in terms of career patterns, perceptions of curricula, and attitudes toward work and further education held by graduates of twelve curricula of the Division of Engineering Technology at New York City Community College (NYCCC). The results were intended to be used not only internally but also externally to provide agencies with information regarding contributions made by the college to business and industry.

The 2,554 students graduating over the seven-year period from 1969 through 1975 constituted the population. In the fall of 1975, a questionnaire was mailed to 2,087 of those graduates, though the method of selecting the sample is not stated (perhaps mailing addresses were not available for the rest of the population). Nine hundred twenty-two graduates returned usable responses, yielding an overall response rate of 44%. A table lists the number of graduates by curriculum and graduation year and also indicates respective response rates.

The development of the questionnaire is not discussed, nor is reliability and validity information provided; however, the instrument is appended. The questions asked were designed to collect data on the following variables: (1) present occupational status; (2) field retention of employed graduates; (3) proportions in senior, supervisory, managerial, or professional positions; (4) change of employers and job titles between first and present jobs; (5) further college attendance; (6) further degrees sought or completed; (7) perceptions of the NYCCC curricula; and (8) other variables related to employment and further education.

The resulting data for each dependent variable are presented in two-dimensional frequency/percentage tables of graduation year by curriculum. Summary results from fourteen earlier follow-up studies are presented for comparison. No statistical analyses were done. The authors point out that results of this study cannot be considered positive or negative because standards for success have not been established. For example, no one has determined how many students should be employed in training-related fields or what percentage of students should continue their education.

The results of the study are discussed in detail and hypotheses are suggested to explain differences in graduates of various years and curricula. Among the results discussed, the following are included:

- 77% of the graduates are employed, 14% are full-time students, 9% are unemployed, and 1% are in the military service or retired.
- Of the unemployed 1974 and 1975 graduates, most are students, whereas few of the unemployed 1969-1971 graduates are students.
- The proportion of employed graduates by curriculum area varies from 47% for architectural technology to 96% for fire-protection technology.

- Of the 607 graduates employed in training-related jobs, 44% have senior, supervisory, managerial, or professional positions.

- Of all employed graduate respondents, 27% found their education extremely helpful in performing their present job, 38% fairly helpful, 24% slightly helpful, and 11% not at all helpful.

- 61% of the respondents attended college after graduation from NYCCC, ranging from 58% for the class of 1974 to 68% for the class of 1971. To summarize the findings, graduates of each curriculum are described in "modal student profiles."

Although the study was clearly done internally both by and for college staff, the researchers were not identified.

EVALUATIVE COMMENTS:

This study was well thought out and is one of the few in which the particular data collected can be traced to an overall purpose. It is quite possible that one fault is an omission in reporting rather than in the study itself: Although information from fourteen previous studies is presented, there is no indication whether the same instrument was used. The point is twofold: Are the data comparable and has the instrument been tested?

Many comparisons are made among graduates of varying curricula and graduation years. Although hypotheses were developed to explain some of the differences, no statistical analyses were performed to indicate whether they were likely to be merely chance differences. Thus, the need for further research designed to test those hypotheses is indicated.

* * *

"A Follow-Up Survey of the Graduates of the High Schools in Vocational Region #8, New Hampshire." Roger D. Crim and Eugene W. Ross. Paper presented to the New England Educational Research Organization Annual Meeting, Provincetown, Mass., May 6, 1976, 32 pp. (ED 123 471)

DESCRIPTIVE ANNOTATION:

This study, conducted to obtain a data base for New Hampshire Vocational Region #8 public secondary vocational educators, is intended to help them plan future curricula and programs. The issues addressed were education and training beyond high school, employment status during the first year after graduation, and current employment status.

The population comprised the 1968, 1970, 1972, and 1974 graduates of the six public high schools within Region #8. The population was stratified by school and graduating class, and a random sample was taken from each of the 24 strata. The sample (1266) was 50.5% of the population (2509).

An interview form was developed, using the Dictionary of Occupational Titles as a guide for categorizing vocations. The interview schedule is appended. Telephone interviewing was conducted by paid, trained interviewers over a two-week period. When the high school graduate could not be reached, information was collected, when possible, from a parent, grandparent, guardian, or spouse. Information regarding 840 graduates was collected, yielding a response rate of 66.4%. The response rates for all strata are tabled.

The data were tabulated in frequencies and percentages, and a composite profile for the region was obtained. No further statistical analysis was done.

Among the 36 findings listed are the following:

- 48% of the graduates received no additional education or training.
- 80% of the graduates were employed immediately after graduation.
- At the time of the study, 63% of the graduates were employed full-time.
- 30% of those employed were employed in clerical and sales occupations, 21% in service occupations.

The authors conclude that all six of their major vocational education areas are represented in the employment profile and that although 26% of the graduates indicated they were unemployed, only 7% were looking for work. Specific recommendations for the Laconia Area Vocational Center are made.

This study was sponsored by the U. S. Department of Health, Education, and Welfare. The senior author is an Assistant Professor of Education at Plymouth State College; the junior author is the Vocational Education Director of the Laconia Area Vocational Education Center #8.

EVALUATIVE COMMENTS:

From the stated purpose of the study, the reader would assume that the population consisted of graduates of vocational programs; however, this fact is not explicitly stated. Further, no differentiation in the various types of vocational courses taken by students was made. As a consequence, it is difficult to account for the reported employment rates.

Relying on sources other than graduates themselves to determine employment status posed a serious methodological problem. Further, there is no indication of how much data were collected from secondary sources. Without some sort of verification, the data cannot be considered reliable.

Since data were collected from graduates of several years, it is unfortunate that some form of trend analysis was not done which would be particularly useful if it could be related to any curricular changes made in those years.

* * *

The Impact of Secondary School Occupational Education in Massachusetts. William G. Conroy, Jr., and Daniel E. Diamond. Lowell: University of Lowell, College of Management Science, Spring 1976, 43 pp. (ED 122 095)

DESCRIPTIVE ANNOTATION:

According to published goal statements, Massachusetts is committed to providing youth with the skills and experiences necessary for entry and success in the labor market. Because of this commitment and because of the wide variety of occupational education programs offered in Massachusetts, this study was conducted to examine the impact of high school programs on the life style of students in college preparatory, general/academic, and occupational programs. It was intended to provide a knowledge base for improving secondary education policy.

The study focused on school/labor-market relations but also addressed citizenship and leisure-time activities. The conclusions drawn and recommendations made in this report are not based on an exhaustive analysis of the data collected. However, the data are available from the Massachusetts Division of Occupational Education for anyone who may wish to explore the data base further.

The research design was ex post facto: A sample of students who graduated (or "should have") from Massachusetts high schools in 1969 and 1973 were asked to respond to a questionnaire mailed in the summer and fall of 1975. A multistage sampling plan was used: first schools, then students. A figure depicting the variables considered in the total design is provided. Questionnaires were mailed to 7,894 students: 2612 responded, 3452 did not; and there were 1800 nondeliverables. If nondeliverables are assumed to be random, the response rate was 43%. Although the findings are not corrected for bias, the data are weighted according to school sampling characteristics.

The survey instrument is not discussed or appended; however, categories of the questions asked are included in the figure depicting the study design. There is some discussion of the operationalization measurement of the variables. Voting behavior is used as a "proxy" for citizenship. Salary data are presented in terms of purchasing power of 1975 dollars.

Fisher t-tests, chi-squares, and correlation coefficients are used to analyze the data and their uses are described. The data collected about major noneducational influences on lifestyle were used as controls so the independent effects of school programs could be estimated. Tables breaking the data down according to such variables as school program, grade point average, and postsecondary education status are presented. Among the eleven summary findings presented and discussed are these:

- There were no differences in average income between females who had occupational training and those who had none.

- For students who did not go on to postsecondary education, the average annual salary of 1973 occupational students was higher than that of nonoccupational students (a finding extremely pronounced for male Trade and Industrial students).

- Two-thirds of occupational students did not work in fields for which they had trained.

Among the conclusions discussed are these:

- The superior labor market behavior of occupational students seems to result from the school program as an independent entity because the effect exists, even after accounting for variables such as socioeconomic status and scholastic aptitude.

- Secondary schools play a minor role in helping youth find employment.

Six recommendations for Massachusetts policy makers are presented.

This study was initiated by the Division of Occupational Education, Massachusetts Department of Education. It was conducted by professors in the College of Management Science, University of Lowell.

EVALUATIVE COMMENTS:

This study is notable for the completeness of the information given, although it is unfortunate that no information regarding the survey instrument is provided. The design is clearly laid out; data were collected on intervening variables; and response bias was considered, although not analyzed. Several aspects of the questionnaire can be inferred from the discussions of summary findings but there is no indication of its reliability or validity.

Another notable aspect of this report is that of offering readers an opportunity to further explore the data base. Not only does this allow analysis of data collected but not analyzed, but also it allows analyzed data to be reanalyzed, perhaps by use of different methods.

* * *

"Intensity of Occupational Training: Its Effects on Subsequent Labor-Market Experiences." Robert E. Allen and Thomas G. Gutteridge. Community/Junior College Research Quarterly. Vol. 2, pp. 367-380, 1978.

DESCRIPTIVE ANNOTATION:

This study was designed to investigate the relative effectiveness of occupational programs of public and proprietary schools at the postsecondary level. Although both kinds of institutions are designed to develop job skills, they tend to differ in the proportion of job skills training and liberal arts education offered. Two other studies have investigated this issue[28] but neither controlled for two important variables likely to affect postgraduate labor-market activity: geographic location and program quality. This study seeks to provide information which will enable the student to choose the type of program suitable to his/her specific abilities, needs, and objectives. The data collected to provide this information concerned student career aspirations and work educational experiences before, during, and after two-year college attendance.

The population comprised alumni who had graduated from four upstate New York two-year postsecondary institutions--two community colleges and two proprietary business institutes. Because both proprietary schools had been in existence for over 100 years and because proprietary schools are subject to extensive regulation in New York, the proprietary and public schools were assumed to be relatively homogeneous with respect to quality.

The sample consisted of a random sample of 50 graduates from each school having a graduating class between 1962 and 1970, thereby excluding the years 1965, 1967, and 1969.

Questionnaires were mailed to 1773 male alumni and usable responses were obtained from 683 graduates (38.5%), but the number was reduced to make the sample more homogeneous by excluding nonbusiness majors and graduates who had received baccalaureate degrees. The study sample, then, consisted of 173 proprietary graduates and 105 community college graduates. A five-minute telephone interview was conducted with a sample of the nonrespondents to assess nonresponse bias. Chi-square analyses indicated that respondents and nonrespondents were not significantly different (.05 level) with respect to several variables.

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[28] S. M. Jung, V. N. Campbell, and J. M. Wolman, "A Comparative Study of Proprietary and Nonproprietary Vocational Training Graduates." Journal of Vocational Behavior 18 (1976) 202-225. Wellford W. Wilms, Public and Proprietary Vocational Training (Berkeley, Calif.: Center for Research and Development in Higher Education, 1975).

An eight-page questionnaire was used for this study. Its development is not discussed, nor is it appended. One question asked respondents to indicate for each full-time job since graduation (1) the name and address of the employer; (2) the scope of the business operation; and (3) the job title, functional area and annual compensation. Another question concerned what extent first and present jobs were related to training. Job satisfaction was measured through the Job Description Index developed by Smith, Kendall, and Hulin.[29]

The labor-market experiences of the public and proprietary samples were examined at two time points; at initial entry into the labor market and at the time of the survey. Chi-squares, t-tests, and multiple regression were used to analyze different aspects of the data.

Among the results discussed are these:

- The type of institution attended did not greatly affect the measured noneconomic aspects of the later labor-market experiences.

- There was a sizable, but not statistically significant (at the .05 level) difference between present salaries of alumni of the two types of institutions, with those of community college graduates being higher.

- Over 50% of the graduates were employed, both initially and at the time of the survey, in positions slightly or wholly unrelated to their training.

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[29] P. K. Smith, L. M. Kendall, and C. C. Hulin, The Measurement of Satisfaction in Work and Retirement. (Chicago: Rand McNally, 1969).

In conclusion, the authors discuss some of the limitations of this exploratory study. They acknowledge that it stressed investment rather than consumption values of education, that the time frame was short compared to the lifelong ramifications of education, and that the study was limited to four schools in upstate New York. Although they suggest the need for further research, they conclude that students can, apparently, "select a school with a pedagogy consistent with their educational objectives without jeopardizing subsequent career opportunities."

The researchers are from the Department of Business Administration, University of Wyoming, and the Department of Organization and Human Resources, State University of New York at Buffalo. The research was conducted pursuant to a grant (No. 91-36-73-13) from the Employment and Training Administration, U. S. Department of Labor.

EVALUATIVE COMMENTS:

Although this study has limitations, including those acknowledged by the authors, it is notable for at least two reasons: (1) It builds on previous research, thus adding to an integrated body of knowledge and (2) An effort was made to assess response bias. The authors' suggestion for further research needs to be followed to lend support to their conclusion that public and proprietary schools do not have differential effects on the career opportunities of students. This conclusion is unwarranted on the basis of a single study because it is essentially an acceptance of the null hypothesis.[30]

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[30] See one of the research texts listed in the technical notes section of this bibliography for a discussion of this point. Very briefly, if research discovers a difference between two groups, it is clear that a difference exists, although the cause may be questionable. If no difference is discovered, however, it may be because the observational techniques and statistical analyses were not powerful enough or were otherwise unsuitable for detecting a difference.

Job Selection Patterns: Linkage Between Vocational Education Programs and the Labor Market. George H. Copa and Bruce A. Kleven. Minneapolis: Minnesota Research Coordinating Unit for Vocational Education, Department of Vocational and Technical Education, University of Minnesota, February 1977, 161 pp. (ED 138 809)

DESCRIPTIVE ANNOTATION:

The purpose of this study was to develop and test a concept for defining the linkage between vocational education programs and the labor market. This concept, termed "job selection pattern," is defined as "a description of the jobs selected by program leavers in terms of frequency, occupation, industry, geographic location, and time." The authors state that meaningful planning of vocational education programs (i.e., planning that will insure gainful employment opportunities for program leavers) can be done on the basis of information concerning labor-market demand only if job selection patterns are identified and if the patterns are stable from year to year (or instability is explained). Stability of job selection patterns refers to the degree to which graduates of a particular program select jobs in similar occupations and industries in the same proportions from year to year. In order to test the job selection pattern concept on graduates of Minnesota area vocational technical institutes, the following objectives were accomplished:

- Describing the pattern of jobs selected by graduates
- Assessing the stability of the job selection pattern of graduates from year to year
- Describing the job selection of graduates by geographic location
- Assessing the stability between years of the patterns of geographic location of jobs selected by graduates
- Assessing the longitudinal stability of the job selection pattern by graduates

The information needed to complete this study had been collected through the Minnesota Vocational Follow-up System (a copy of a portion of the instrument is appended). However, all the information for every program had not been coded or stored in the computer system. Therefore, a purposive sample of program areas with stored information was selected. The criteria used for selecting the programs are discussed. The programs selected were as follows: agri-technology; automotive; clerical training; food preparation (chefs and cooks); electronics; machine shop; practical nursing; and sales and business management. Samples of students graduating in 1970, 1971, and 1972 were chosen to restrict the sample size to 100-150 graduates of each program who were employed each year. Thus, for some programs, a random sample was taken, whereas for smaller programs, all working graduates were included.

Graduates of 28 of Minnesota's 34 area vocational technical institutes were included in the sample. Demographic characteristics of the institutes and the students included in the sample are discussed, and a table is provided indicating numbers and percentages of students returning the follow-up questionnaire and of those currently employed. The average return rate of the Minnesota Follow-up System over all postsecondary area vocational-technical institute graduates was approximately 80%.

Most of the data analysis was accomplished through compilation of frequency distributions and determination of percentages; chi-squares were used to assess the statistical significance of change in patterns over time.

Results of the study, relative to each of the objectives listed in the first paragraph of this annotation, are discussed by occupational program area. For each program area, a matrix is provided indicating percentages of graduates employed in various occupations (e.g., professional, sales, blue-collar) in various industries (e.g., agriculture, manufacturing, finance, entertainment). One of the findings discussed is the percentage of graduates over the three-year period remaining in the same major occupational and industry group from the first job to job-after-one-year (from 56 to 59% for most program areas).

Among the seven conclusions and recommendations listed and discussed are these:

- There is a characteristic pattern of jobs selected by graduates of vocational education programs unique to each program and with overlap between program areas.

- The job selection pattern changes during the first year after graduates leave vocational education programs, and the degree of change varies between programs.

- Follow-up data on vocational graduates should include the information necessary to construct job selection patterns in order that the utility of the concept may be further assessed.

- Studies to explain the unstable aspects of job selection patterns should be initiated, in order to increase the utility of projected information concerning labor-market demand and to identify means of effecting needed changes in selection patterns.

EVALUATIVE COMMENTS:

The stated purposes of many vocational education evaluation studies indicate that the studies are done to provide information for planning purposes. The authors of this report state that information about job selection patterns can increase the validity of planning that is based on information concerning labor-market demand, but that data required to compile such information are rarely available. The authors acknowledge that further exploration of the job selection pattern concept is necessary, and this document makes a convincing case for the desirability of collecting the data necessary for such further testing.

* * *

"Little Woolly Horses and Saber-Toothed Tigers: The Misguided Vocational Education Curriculum." Everett Egginton. Louisville: University of Louisville, n.d., 42 pp.[31]

DESCRIPTIVE ANNOTATION:

The intent of this study is "to examine the relationship between enrollment in vocational education programs and attitudes toward self and toward education." Specifically, it addresses the question "Does participation in vocational education programs result in positive attitudinal changes among students?" The author considers this question of general interest because there is "a lack of evidence to support educators' claims about the efficacy of vocational education programs..." and specifically because "alienation among students in vocational education programs...is at an all-time high even though positive attitudes toward self, toward education and ultimately toward work are unquestionably important goals of virtually all vocational education programs." The specific hypotheses tested are twofold: (1) Vocational education students have a more negative self-image than nonvocational or academic students. (2) Vocational education students have a more negative attitude toward learning than nonvocational or academic students.

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[31] No further citation is given on this unpublished paper; however, an article based on it appeared in Phi Delta Kappan (April 1978, pp. 533-534) under the title "Is Vocational Education Meeting Its Objectives?"

The students constituting the sample were selected from public high schools in Kentucky through a proportional stratified random sampling technique. Schools were randomly selected from the state's fifteen vocational education regions, and a questionnaire was administered to approximately 50 per cent of the juniors and seniors from each selected school. Valid responses were obtained from 8145 students.[32] Two possible biasing factors were mentioned: (1) Principals and guidance counselors, rather than researchers, drew the samples and administered the questionnaires; thus, improper sampling may have occurred and/or inadequate instructions regarding the questionnaire may have been given to the students. (2) Some of the schools randomly selected were unwilling to participate, thus the study sample may not have been representative of the population.

As part of a project directed by Dr. Keith Bayne (a professor of Vocational Education at the University of Louisville), a 38-item multiple choice questionnaire was administered to the above-described sample between September 1 and December 15, 1976. The study here annotated consists of Egginton's analysis of some of those questionnaire items. The purpose for which Bayne developed the questionnaire is not discussed; however, the instrument is appended.

The independent variable--enrollment in a vocational program--was defined by answers to the question: "Are you presently enrolled in a vocational program (examples: business and office, distributive education, health occupations, agricultural education, etc.)?" All students who answered yes were classified as vocational students and the others as nonvocational. General and college-preparatory students were not separately analyzed.

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[32] The total public high school enrollment in Kentucky in 1976 was 216,009 [U.S. Bureau of the Census. Statistical Abstract of the United States: 1977 (98th edition, Washington, D.C., 1977)]. Thus, over 3.7% of the juniors and seniors were sampled.

The dependent variables--self-image and attitudes toward education--also were measured by responses to specific items on the student-survey questionnaire. Two questions, each requiring a yes or no answer, were used to assess two aspects of self-image--defensiveness and inadequacy: "Do you usually feel like the world is against you?" and "Do you usually feel that most people do things better than you do?" The question used to assess attitude toward learning was not identified, but presumably it was "How do you feel about learning?" The choices were (1) like learning most of the time, (2) like learning some of the time, (3) like learning only things of interest, and (4) dislike learning most of the time.

Four control variables are used in analyses of the hypotheses: sex, age, ethnic origin, and family income. Although the questionnaire elicited more precise information, the latter three variables were artificially dichotomized: 16 and under--17 and over; white--nonwhite; $9,000 or less per annum--more than $9,000 per annum.

The data are all reported as cross-tabulations, including number of respondents as well as percentages; missing values and missing cases are reported. The phi coefficient of correlation was used in all analyses and the attained significance level is reported.

Among the results reported and discussed are the following:

- "Participation in the vocational education curricula is apparently associated with feelings of defensiveness, although the relationship is slight." (ϕ = .02)
- "The association between vocational education curricula and feelings of defensiveness holds--and indeed is strong--for students 16 and less but virtually disappears for students age 17 or more." (ϕ = .05 and .007 respectively)
- "Participation in vocational education curricula is associated with feelings of inadequacy, although, as was the case with defensiveness, the relationship is slight." (ϕ = .02)

- "When controlling the age, however, the relationship [between enrollment in vocational programs and feelings of inadequacy] is not sustained for either the younger students or the older students." ($\phi = .02$ in both cases)

- "There is a significant and inverse relationship between enrollment in vocational curricula and [positive] attitude toward learning." ($\phi = .05$)

The author concludes ". . . vocational education programs in general are ineffective in changing [negitive attitudes and differences between vocational education students and their academic counterparts]." He states, "Despite the massive investment of funds in vocational education programs and despite the recognition that vocational education curricula should address the problem of negative values and attitudes, the vocational education student still holds himself in low esteem and tends to treat learning with disdain."

Egginton then makes several recommendations not linked to the data analyzed in this study. For example, he states, "In order to begin to combat the problem of negative attitudes, low self-image, and disdain for learning among vocational education students, the larger society must provide the prestige, status, and remuneration which will make vocational education seem worthwhile to the student." Further, he supports views attributed to Terrel Bell, "Different and separately administered academic and vocational programs serve no useful ends"; to M. E. Borus, "On-the-job training, apprenticeships, and other non-formal methods of vocational training . . . are more efficient and cost-effective than the vocational training provided by schools"; and to P. J. Kelly, "The most important job skills which a high school graduate can possess are those provided by general education."

The author of this report is a professor at the University of Louisville. It is stated that Kentucky was chosen for this study because its "posture toward public vocational education programs appears to be representative of the willingness of many of the states to establish vocational education as a top priority in public education," and appreciation is given to the Kentucky Bureau of Vocational Education for permission to analyze the data, but no further indication of sponsorship for this study is given.

EVALUATIVE COMMENTS:

Although this study is notable in that, unlike the other studies listed in this bibliography, it addresses an immediate impact of vocational education, it is fraught with so many methodological problems as to make its conclusions unwarranted. This is not to say that the conclusions are necessarily inaccurate, but rather that they are neither supported nor contradicted by the study.

The instrument used in the study is appended, but its development is not discussed. No information is given concerning its reliability and validity. Even among the valid responses collected, each question analyzed in the study was answered by only one to three percent of the students. Further, no rationale is given for judging defensiveness, inadequacy, and attitude toward learning on the basis of one questionnaire item each.

Egginton hopes to answer the question "... Does participation in vocational education programs result in positive attitudinal changes among students?" His design, however, does not allow for analysis of change. No argument is made to support the assumed comparability of vocational high school students and all other high school students in terms of factors that may affect self-image. There is no attempt made to analyze statistically the collected data that best suits the question of change--namely, the attitudes of sophomore vocational students as compared to those of senior vocational students.[33]

Another important problem is that of statistical significance as opposed to meaningful significance. Although several of the relationships analyzed were found to be statistically significant, the largest coefficient of determination obtained was .0098.[34] This coefficient indicates that less than 1% of the variance in any of the variables studied can be accounted for by any other variable. The meaningfulness of this small amount of variance is questionable.

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[33] Although it is stated that juniors and seniors were sampled, data tables indicate that sophomores were as well. Even if there were too few sophomores for meaningful comparisons, an exploratory comparison could have been made, accompanied by a suggestion for further data collection.

[34] See one of the research texts listed in the technical notes section of this bibliography for a discussion of this point. Briefly, the square of a correlation coefficient is the coefficient of determination. When multipled by 100, the result indicates how much of the variance in one correlate is explained (not necessarily caused) by the other.

Egginton draws conclusions that do not follow from his data. For example, he states, "Table 3 demonstrates that the association between vocational curricula and feelings of defensiveness holds--and indeed is strong--for students age sixteen and less but virtually disappears for students age seventeen and more" (emphasis added). First, the phi coefficient of .05149 that he reports cannot be said to indicate a strong association (it explains only one quarter percent of the variance). Second, he later concludes that vocational students have a more negative self-image (defined in terms of defensiveness and inadequacy) than nonvocational students, and "these group differences are sustained for the older . . . students" (emphasis added). He also makes recommendations without clearly stating that they are not directly based on the research reported in his paper. For example, he states that on-the-job training is more efficient and cost-effective than vocational education provided by the schools, although he reported no data regarding relative effectiveness of various vocational training methods.

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1975 Career Student Follow-up: Initial Placement. Michael Quanty. Overland Park, Kansas: Office of Institutional Research, Johnson County Community College, April 1976, 25 pp. (ED 126 999)

DESCRIPTIVE ANNOTATION:

Johnson County Community College (JCCC) is required to report employment data on its graduates and on students who leave with marketable skills to the Kansas State Department of Education and the Kansas Manpower Utilization System for Training. These required data are used to justify expenditure of state and federal vocational funds on career programs. The college takes the opportunity provided by this mandated data collection to acquire additional data for use in its ongoing self-evaluation process.

The 177 graduates and 41 nongraduates with "marketable skills" who left ten career programs (Basic Police Training, Data Processing, Dental Hygiene, Drafting, Electrical-Electronics Technology, Fashion Merchandising, Law Enforcement, Marketing and Management, Nursing, and Secretarial Careers) during the 1974-75 academic year constituted the basic population for this study. Responses were obtained from 94% of the population, and also from seven students from the program for the hearing impaired, two of whom were also enrolled in career programs.

Most of the data were collected through telephone interviews, although the students with hearing impairments were contacted personally. Career program coordinators telephoned graduates and early leavers from their respective programs; when the graduate or leaver was not available, the coordinator attempted to obtain information from a close relative or work associate. The telephone interview guide is appended. Questions addressed employment status (whether employed in program area, in a related area, or otherwise employed; whether attending school in a training-related area or in another area; unemployed; deceased or disabled; in the armed forces); adequacy of training; and gross annual and monthly salary. Additional questions concerning the specific programs were asked by some of the coordinators (e.g., concerning interest in alumni group participation, or in additional coursework).

The data are reported as percentages, both for the total sample and by program; no statistical analyses were performed. In addition, some data collected in the previous three follow-up studies are provided but no comparisons are made.

Several results are discussed. Of the former students, 70% were employed in a job for which they had been trained and 17% were in a training-related job. For two of the programs, students had to be employed before admission; and, excluding these students, 63% and 21% respectively were so employed. Of those employed in training or training-related areas, 67% believed their training helped them obtain their jobs. Overall, 93% rated the JCCC program as either excellent or good, and at least 80% of the students in each program gave excellent or good ratings. The two students with hearing impairments who had been in career programs (drafting, electronics) were employed full-time, but neither in the area of training. No interpretations are made or conclusions drawn from the results reported.

This report was done by a member of the college's Office of Institutional Research. According to the title page, it was prepared for administrative review.

EVALUATIVE COMMENTS:

Presumably, because the report was prepared for administrative review, it was purposefully left to the administrators to interpret results and draw conclusions. More information would facilitate this effort, for example, why some students do not find training-related employment and what particular aspects of their programs helped students obtain jobs--their diploma or the skills they had obtained. To allow such interpretations to be made, additional data need to be collected.

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1000 Employers Look at Occupational Education. Martin Hamburger and Harry E. Wolfson. New York: Board of Education of the City of New York, July 1969, 216 pp.

DESCRIPTIVE ANNOTATION:

This was the first in a series of studies planned to provide a sound base for curriculum redevelopment in the occupational education programs of the New York City Board of Education. The objectives of the overall plan to make fundamental changes in occupational education were as follows: (1) to improve the curriculum; (2) to extend occupational education to more youth; and (3) to introduce a multilevel approach with a variety of time and sequence organizations.

This study was designed to survey employers in an effort to determine how to prepare a greater number and variety of young people for better jobs. Effective questions to be asked were discussed in workshops--one composed of leaders from industry, commerce, labor, and education; the other composed of administrators, supervisors, and teachers in the New York City Schools.

This project was conducted from February 1 to June 30, 1968, following a long planning period. From all the occupational areas in New York City, a sample of curricular areas was selected based on diversity, importance, projected growth, and adaptability to a variety of school plants and organizations. The five areas selected--business, health, automotive, metal-working, and electrical/electronics--include predominantly male, predominantly female, and mixed occupations. They include also a range of skill levels ... a balance between white and blue collar, between industrial and service, and between stable and rapidly changing fields. Firms of various sizes were selected from each category. Interviews were held with 1056 employers, with usable data obtained from 994. Because the final sample was not chosen through a rigorous sampling plan, but rather was based on the criteria stated above and on availability and cooperation, the authors note that what was done was a case study of selected employers rather than a study of a random sample. Interviews were held with presidents, managers, personnel directors, and production supervisors.

Project staff prepared an open-ended questionnaire and interview guide but, after using it, decided that a more objective approach would be more fruitful. The instrument was then redesigned. The redesigned questionnaire, which is provided in an appendix, basically follows a checklist format, although open-ended comments related to each question are sought as well. Included are questions about job needs, job titles and duties, pay levels, desired educational levels, etc.

The instruments were used during team visits to each employment site. Five teams were selected, each including one teacher and one guidance counselor. Team members were assigned full-time to the project and were released from their teaching and counseling responsibilities for its duration. An intensive three-week training period was held, followed by weekly staff meetings during the beginning of the data-collection phase.

The data analyzed for this study consisted of responses to the survey questionnaires and impressionistic statements written by the interviewers. The interviewers also wrote recommendations for curriculum development. Quantitative data were synthesized into question-by-question summary tables and qualitative data were content-analyzed so they could be condensed. Excerpts from comments and recommendations are presented, both in the text and in appendixes.

Findings are presented primarily by occupational groupings in both a detailed chapter and a summary chapter. Among the findings discussed are these:

- Contacts between schools and employers tend to be "hit-or-miss."

- Employers indicate that the kind of reading skills taught, such as reading work orders and technical manuals, is as important as the amount taught.

- Although a substantial minority of employers consider on-the-job training best, for the most part employers feel that a school-job partnership is optimal for occupational training.

These and other findings are discussed in detail; many tables are presented; and limitations of the data are discussed as well as their implications.

This study was funded under the Vocational Education Act of 1963 and was approved by the Board of Education of the City of New York and the New York State Department of Education. One principal researcher was a Professor of Education at New York University and the other was Assistant Superintendent, Office of High Schools, New York City Board of Education.

EVALUATIVE COMMENTS:

This study was conducted to collect employer data for use in curriculum development. It can thus be viewed in the context of discovery rather than as an attempt to verify any hypotheses about the outcomes of vocational education. The report is exemplary in being very thorough: The purpose is clearly stated; the relationship between collection and analysis of data and the purpose is discussed; the procedures and instrumentation are detailed; and limitations of the study are discussed. The authors acknowledge one limitation: since no standards exist for determining how much contact there should be between schools and employers, a description of that amount of contact is an inadequate basis for appraisal.

* * *

Outcomes of Vocational Education in Virginia 1978: A Summary of the Follow-up of 1976-1977 Secondary Vocational Education Completions in Virginia. Donald E. Elson. Richmond: Virginia Department of Education, Vocational and Adult Education, 1978, 18 pp.

DESCRIPTIVE ANNOTATION:

The information reported in this document was collected as part of the annual follow-up begun when the Vocational Education Reporting System (VERS) was implemented in Virginia during the 1972-73 school year. Data were collected from former students concerning employment status, on-the-job use of knowledge and skills learned in vocational programs, wage rates, and perceptions and attitudes toward their vocational programs. No specific research questions or hypotheses are listed.

This study was conducted in January 1978, approximately seven months after the close of the school year. The population was Virginia public high school students who had completed a vocational education program during or after the 1976-77 school year or who had left school with marketable skills before completing their programs (how their marketable skills were determined is not stated). All business education students and a stratified sample of students from other vocational programs were studied. Tables indicating total completions in each area, sample size, and number of usable responses are provided. The overall response rate was 55%, representing 10,961 usable responses from the 19,869 students surveyed. Response bias was analyzed using chi squares on various demographic characteristics. The data are summarized in a table. There are two statistically significant differences: (1) More females than males responded. (2) Proportionately fewer students who had left school prior to scheduled graduation returned questionnaires than students who were completers. Development of the instrument is not discussed, nor is it appended, but the several tables and the discussions clearly indicate the nature of the questions asked and the form of the response. Reliability and validity information is not provided.

Percentage data for all questions asked are presented in "pie charts" and bar graphs for each vocational program area. No statistical analyses were done. Comparisons are made to the 1975-76 school year.

Among the findings discussed are the following:

- 39.15% of the respondents were employed full-time in the field for which they were trained, or in a related field.

- 82.76% of the respondents were employed full- or part-time, were continuing their education, or were in the military service.

- 25% of the respondents were continuing their education.

It is concluded that vocational education programs are effective in helping former students to obtain employment.

The Vocational Education Reporting System was developed cooperatively by the Virginia Division of Vocational and Adult Education and the Division of Vocational and Technical Education, Virginia Polytechnic Institute and State University. The author is a faculty member. Staff of the Virginia Department of Education contributed to the data analysis and development of the report.

EVALUATIVE COMMENTS:

Although a purpose for this study was not stated, it can be inferred from the conclusion that the purpose was to assess the effectiveness of Virginia's public secondary vocational programs in helping students obtain employment. The follow-up system reported here may be capable of yielding accurate descriptive information about what has happened to former students, but it does not collect sufficient data from which to infer causes. In order to ascertain whether students obtained employment because of the program or some other factors or whether failure to obtain employment can be attributed to the vocational system, comparisons must be made and other data collected such as unemployment rates in general in the community, unemployment rates of nonvocational students, and availability of jobs.

Regardless of the quality of the reporting system, the response rate for this particular study was too small to ensure that the study sample was representative of the population. Although response bias was analyzed through use of demographic characteristics, there is no assurance that other factors, such as employment status, did not influence tendency to respond.

The ability of students to accurately assess the usefulness of their training is questionable, as is their tendency to give an honest and thoughtful response to a questionnaire item. Other data could be collected in an attempt to verify the conclusion that training is helpful.

For example, employers' opinions could be sought or employed graduates of nonvocational programs could be asked whether they found their lack of training to be a disadvantage.

* * *

"Outcomes of Vocational-Technical-Transfer Programs at Community Colleges, Technical Schools, and Similar Types of Institutions." Richard J. Noeth and Gary R. Hanson. Paper presented at the Association for Institutional Research Annual Forum, Los Angeles, California, May 1976, 16 pp. (ED 122 892)

DESCRIPTIVE ANNOTATION:

This study, conducted in 1975, was designed to assess the outcomes of postsecondary vocational-technical-transfer programs. Specific questions were addressed:

- What is the present educational-vocational status of individuals who began vocational-technical-transfer programs at community colleges, technical schools, and similar types of institutions in the fall of 1970?

- How do students' final programs relate to their occupational experiences and to their future occupational plans?

- Do individuals working in program-related occupations feel that their postsecondary training affected the level of their present employment?

- Are individuals working in program-related occupations satisfied with their present jobs and would they go through the same program again?

In the fall of 1970, 22,342 students from 110 community colleges, technical schools, and similar institutions across the nation completed the American College Testing Program's Career Planning Program as part of the national norming (of ability, interests, job choice, job values, etc.).

In 1975 a follow-up sample of 4,350 former students was selected from the above group. For this sample, male and female students were selected from Business and Marketing, Accounting, Science, Social Science, and Arts and Humanities programs; only males were selected from Electrical Engineering Technology and Auto Mechanics; and only females from Nursing programs. A final response rate of 60%--equivalent to 95% of those for whom accurate addresses were available--was achieved with 2594 former students from 109 institutions responding.

The survey questionnaire was pretested extensively before it was mailed to the student sample. Its development is not described nor is the instrument appended.

The data from all former students who responded to all the items pertinent to each analysis were cross-tabulated--vocational programs (Business, Auto Mechanics, etc.) by criterion measures (present occupation, job satisfaction, etc.). Several tables are provided.

The following findings related to each of the four study questions are discussed:

- Among the respondents, 1,489 were employed outside the home, 234 were continuing their education, 124 were homemakers, and the rest were unemployed for various reasons.
- Most of those currently employed held jobs for which they were trained (percentages are provided by program area).
- Over 75% of the currently employed individuals agree that they could not have obtained their present jobs without their postsecondary education.

Among the major conclusions discussed are these:

- About 75% of currently employed students are employed in their area of training.
- Students tend to gravitate toward jobs related to the educational program they have completed, although their first job may not be directly related.
- Those employed in training-related jobs are highly satisfied with their present occupations and the majority would enter their training programs again, if faced with a choice.

This study was conducted by a research psychologist and the Assistant Director of the Developmental Research Department, Research and Development Division, The American College Testing Program.

EVALUATIVE COMMENTS:

This study cannot be replicated from the information given, but since it is a report of a paper presented at a conference, that is not to be expected. Cross tabulations of data are provided but because statistical analyses are not, it is not clear how likely it is that differences are due to chance.

The stated purpose of this study is to assess outcomes of post-secondary vocational-technical-transfer programs. It is unfortunate that the reason behind the purpose is not stated. It is difficult to further evaluate the study without knowing how it was meant to be used. It does give an indication of the average (nationwide) success of the programs studied, but sufficient information for further conclusions is not provided.

* * *

A Program Review of Secondary Vocational Education in Ohio: Job Placement and State Funding. Ohio Legislative Services Commission, Staff Report No. 126, April 1978, 73 pp.

DESCRIPTIVE ANNOTATION:

This study was done to provide feedback on the results of earlier vocational education policy and funding decisions and to provide useful information and guidelines for future legislative decisions. The study focuses on the job placement of vocational graduates (at the secondary level) and on related issues such as graduate job satisfaction and graduate performance as evaluated by employers. The issue of how state funds can be better distributed to meet program costs is also addressed but will not be discussed in this annotation.

Ten vocational education planning districts (VEPDs) were randomly selected from the 65 that had graduated their first senior class by 1976. Four-day field visits were made to schools in these districts and one-day visits were made to

Akron City Schools and to a Joint Vocational School in the Columbus area (on the recommendation of the State Vocational Education Division that they had excellent placement programs). One hundred sixty-six employers were interviewed by phone. Formal questionnaires were administered to vocational instructors and to placement coordinators, as well. The sample districts are described in an appendix.

The questionnaires used in the staff field visits are not discussed in the report, although they are appended.

Findings are presented in narrative form in tables of percentages and graphs of trends from fiscal year 1974 through fiscal year 1976. Comparisons on job placement are made among VEPDs and among vocational programs. Employers, where possible, compared vocational graduates to graduates of general programs.

The results are discussed in great detail, including consideration of intervening factors such as availability of employment. The following findings are reported:

- Vocational programs similar to those offered by technical colleges or proprietary schools do not have good placement records.
- More than 90% of the graduates indicated that they would enroll in vocational education again.
- Students and teachers expressed concern with technical skills, whereas employers stressed employability skills and adaptability.
- 58% of the employers hire vocational graduates for jobs that nonvocational high school graduates cannot fill without further training.
- 76% of employers said they prefer to hire vocational graduates rather than general high school graduates.
- A few students in each sample district said they would have dropped out of high school had there not been a vocational program.

Two conclusions reached are that the vocational education program in Ohio has been relatively successful in job placement and that employers, while generally satisfied with the skills of vocational graduates, would favor increased communication with school officials. The need for a closer look at guidance and counseling and at the effects of vocational screening is suggested, and other areas for further research are indicated.

In 1977, the Ohio Legislative Services Commission selected a Subcommittee on Legislative Oversight; it subsequently recommended education as one area for joint legislative-staff oversight projects. Staff and legislators received training and technical assistance in program review from Rutgers University's Eagleton Institute of Politics. This study was one of the projects undertaken. It was reviewed and monitored by the Joint Education Committee for Program Evaluation.

EVALUATIVE COMMENTS:

This study was well defined and thoroughly conducted. It is one of the few studies that compare perceptions of teachers, students, and employers. It is notable also for its discussion of economic conditions in the labor market and other variables that affect placement rates. Lacking are (1) a discussion of the development of survey instruments and (2) the collection of placement rate data for nonvocational graduates.

* * *

A Study of Community College Students Who Are Graduates of Vocational Technical and College Preparatory Curriculums. Ronald J. Horvath. Schnecksville: Lehigh County Community College, Pennsylvania Department of Education, Bureau of Vocational, Technical and Continuing Education, July 1, 1973, 96 pp. (ED 096 554)

DESCRIPTIVE ANNOTATION:

Although most community colleges maintain an open-door admissions policy, there are varying interpretations of the concept. Some colleges limit admissions to students who have completed high school college preparatory curricula, whereas others also admit students who have completed vocational curricula. The author states that decisions on interpretation of the open-door concept are seldom based on empirical data. This research focuses on the issue in an attempt to provide teachers, counselors, and administrators with better insights into the needs and background of students (e.g., Should students take vocational or college preparatory curricula if they intend to enter community college, and should they enroll in transfer or occupational programs?). Specifically, the following three questions are addressed:

- Are community college students who are graduates of vocational technical programs similar to or different from graduates of college preparatory programs in intellective and demographic characteristics?
- What are the relative completion or noncompletion records of college preparatory graduates as compared with those of vocational technical graduates?
- What are the intellective and demographic characteristics of the vocational technical graduates who enroll in a related college curriculum, in an unrelated one, or in a transfer program?

Six hypotheses relative to these questions are investigated.

All male students in two Eastern Pennsylvania community colleges who could be identified as having completed one year or more in a high school vocational technical program (excluding commercial, general, industrial arts, and distributive programs) constituted the vocational technical (VT) sample; 229 were identified. The college preparatory (CP) sample consisted of a random sample of 200 male graduates prorated among the entry years of 1967, 1968, 1969, and 1970, using the number of VT entrants as a base. This represented 10-15% of the full-time male population. Approximately 90 percent of the students in the samples were graduated from high schools within the sponsoring districts of the two colleges (included are four vocational technical secondary schools and no comprehensive secondary schools).

The primary sources of data were the students' college transcripts and personal files, which contained high school transcripts, class ranks, IQ scores, and American College Test (ACT) scores.

Demographic differences and graduation and program associations were tested with chi-squares. The primary data analyses of group differences were accomplished through univariate analyses of variance (t-tests and F-tests). A .05 level of significance was used in interpreting the results.

Although CP graduates scored significantly higher than VT graduates on six of the seven educational variables tested (the exception was high school rank) and achieved significantly higher first-semester and final grade point averages, there was no significant difference in college graduation rates for the two groups. Therefore, the author concludes that this study adds a degree of credibility to the community college open-admissions policy. Other results, pertaining to the different community college programs VT graduates enter, are discussed and areas for further research are suggested.

The author is affiliated with Lehigh County Community College, one of the colleges in the study. Apparently, the sponsor of the study was the Pennsylvania Department of Education, Bureau of Vocational, Technical and Continuing Education.

EVALUATIVE COMMENTS:

An important strength of this study is that it had a specific purpose and hypotheses related to other research, as indicated in the literature review section. Thus, the study adds to a body of knowledge rather than being an isolated work. Further research is clearly needed, however. For instance, the relative importance and consequences of community college grades and community college graduation should be investigated. Following that determination, correlates of grades and graduation that are more specific than the general vocational technical as opposed to college preparatory high school curricula should be investigated.

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A Study of the Costs, Benefits, and Effectiveness of Occupational Education. Austin D. Swanson. Buffalo: Faculty of Educational Studies, State University of New York at Buffalo, March 1976, 96 pp. (ED 120 523)

DESCRIPTIVE ANNOTATION:

This study was conducted to provide the Board of Cooperative Educational Services (BOCES) for the district serving nine component school districts south of Buffalo, with "evidence as to what, if anything, was being accomplished [by its vocational programs] that was beneficial to the region." Five evaluative criteria had been previously established by the Board and its professional staff, and two were added for this study:

- Upon completion of an occupational program, 65% of the students will indicate that they would take the same program again if they were making the choice.
- 75% of the graduates of any licensed occupational program will pass the appropriate examination.
- Within six months after graduation 60% of the graduates available for and having sought employment will be employed full-time.
- Within six months after graduation, 35% of the graduates available for and having sought employment in their specialization will be employed full-time in their area of specialization.
- Within six months after graduation, another 15% of the graduates available for and having sought employment in their specialization will be employed full-time in a position they consider related to their area of specialization.
- The high school dropout rate will show a decline over the years.
- A high school education will prepare graduates to participate successfully in a wide variety of conversation topics and in leisure and civic activities.

This study was designed to address those criteria and to accomplish the following objectives as well:

- To compare per pupil costs of vocational and nonvocational high school programs in the Buffalo, New York, metropolitan area
- To compare the relative success of vocational students and nonvocational students in terms of employment and earnings and also in terms of selected noneconomic considerations (on the basis of the established objectives listed above)
- To calculate benefit/cost ratios for vocational programs

- To develop decision matrices for evaluating likely costs and effectiveness of alternate approaches for meeting the district objectives for occupational education

The three phases of the study, conducted during the 1974-75 academic year, were (1) a program cost analysis, (2) collection of effectiveness and control data, and (3) cost/benefit-cost/effectiveness analyses. Costs were determined on a per pupil basis for the 1972-73 school year. Effectiveness data were sought from the 628 participants of BOCES occupational programs who were members of the classes of 1969, 1971, and 1973 and from a random sample of 422 non-BOCES, noncollege bound[35] students from the classes of 1967 (prior to establishment of the BOCES program), 1969, 1971, and 1973. Usable responses were received from 61.5% of the BOCES alumni and 55.2% of the non-BOCES alumni. A table indicating response rates from each class is provided. School and background characteristics were analyzed for respondents and nonrespondents to determine whether there were any significant differences between the two groups. The only statistically significant difference found was between the Occupational Grade Average of BOCES respondents and that of nonrespondents; since the averages were 79 and 78, respectively, it is doubtful that the difference has practical significance.

The study design and methodology are thoroughly described as are the methods of analysis. For example, the difference between expenditures and costs is defined: "Expenditures refer to the dollar value of resources purchased during a given time period ... [whereas] costs refer to the amount of resources consumed during a time period." As another example, it is stated that average teacher salary figures are used to preclude a bias against programs that happened to be staffed with more experienced teachers.

Two instruments were used to collect effectiveness data, and both are appended. The School Record Form was used to consolidate data taken from school files including, for example, grade average, class rank, IQ, standardized achievement test scores, and major course sequence. The Alumni Survey Questionnaire has three forms: (1) a mailed questionnaire for BOCES alumni; (2) a mailed questionnaire for non-BOCES alumni; and (3) a telephone interview schedule used as a follow-up for nonrespondents. The first two forms of the Survey Questionnaire were identical except that the terms "high school" and "Vocational Center" were interchanged where appropriate. Three hundred twenty-one responses were gleaned from the mailed questionnaires and 309 from the telephone interviews. The telephone questionnaire was, in essence, an oral version of the mailed questionnaire: both the substance of the questions and the response formats were the same.

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[35] Noncollege bound students were those for whom no high school credentials were sent to postsecondary institutions during or shortly after their senior year. Approximately 20% of these students did attend a postsecondary institution, but "long after leaving high school."

Study findings are reported under several subheadings: cost analysis; school record profiles of BOCES and non-BOCES students; student performance compared with district objectives; cost/benefit analysis; and cost/effectiveness analysis--BOCES vs. home school programs; curtailing expenditures while maintaining effectiveness; and increasing effectiveness without increasing total cost. The terms graduates, alumni, and students are used interchangeably throughout discussion of the findings; for simplicity, the 30 students who did not graduate are not differentiated from those who did.

Among the findings the following are reported and discussed:

- There are considerable differences between students who select BOCES occupational programs (i.e., those who spend some of their school time working in a job related to their training under a cooperative arrangement between the school and the employer) and students who select specializations in their home schools. Although most students in both groups viewed high school as the terminal point in their formal education, the non-BOCES group includes occupational majors such as business and home economics as well as nonoccupational majors such as art and foreign language.

- The non-BOCES students scored significantly higher (.05 level) on IQ tests and achieved markedly higher percentile rankings in reading and mathematics achievement tests and in class rank. The differences are similar when males and females are analyzed separately, although they are more dramatic for males.

- When the BOCES option became available, there was a decline in the ninth and tenth grade dropout rates but an increase in the eleventh grade dropout rate. Dropping out may have been deferred in anticipation of the BOCES option but, when provided, the option may not have been sufficient to keep some students in school until graduation.

- For the entire period of the survey, 40% of the non-BOCES students indicated that they would not re-enroll in the same program if they had to make the choice again, whereas 27% of the BOCES students would not re-enroll.

- Of the cosmetology graduates who took the licensing examination, 94% passed; however, 38 out of the 107 graduates did not take the exam.

- 82% of the male BOCES graduates and 81% of the male non-BOCES graduates located a full-time job within six months of graduation.

- BOCES and non-BOCES alumni had similar characteristics in such matters as conversation topics, leisure-time activities, and participation in organizations.

- In the cost/benefit analysis, the only independent BOCES effect on hourly wages was that males earned more in their first jobs--an average difference of 24¢.

- The Trade Electricity program was the only program that had a benefit/cost ratio in excess of 1.0; after seven years it was 2.0 and growing.

This study was conducted by a Professor of Education at the State University of New York at Buffalo for the Board of Cooperative Educational Services.

EVALUATIVE COMMENTS:

This is a complex study; various aspects of it need to be assessed according to different criteria.[36] The report is very thorough and well organized with a detailed table of contents and several tables facilitating use of the document.

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[36] For example, see Darcy, Perspective for a discussion of some of the pitfalls of cost-benefit and cost-effectiveness analyses.

The study is notable for at least two reasons: (1) The characteristics of respondents and non-respondents are compared; (2) graduates from two general types of programs are compared. It is perhaps unfortunate that no differentiation is made between the non-BOCES students enrolled in occupational programs and those not enrolled in this area; however, the assumption presumably is based on the theory that all high school programs are in a sense "occupational" for students who do not intend to pursue further education or training. This is an issue that deserves further attention.

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A Study of the Status and Effectiveness of Cooperative Office Education in New Jersey, 1968-69. Carmela C. Kingston. Occupational Research Development Monograph No. 8. Trenton: The Research Coordinating Unit for Vocational-Technical Education, Bureau of Occupational Research Development, Division of Vocational Education, New Jersey State Department of Education, 1970, 40 pp. (ED 060 182)

DESCRIPTIVE ANNOTATION

This study was done to determine the status of public secondary cooperative office education (COE) programs in New Jersey and to evaluate the effectiveness of those programs in preparing students for office jobs. It was also meant to serve as a model for evaluation of other cooperative programs. It was hypothesized that COE students would be superior to noncooperative office education students in the following respects: that they would be employed sooner, would have more responsible positions, would receive higher earnings, would have greater job satisfaction, and would be rated more highly by their supervisors.

The population comprised personnel from New Jersey secondary public schools having COE programs during the 1968-69 school year: principals, business education department chairpersons, cooperative education coordinators, COE graduates and non-COE graduates (those who had been enrolled in business classes and who had planned to secure office jobs after graduation but had not participated in cooperative programs); employers of those graduates were also included. All the principals, chairpersons, and coordinators and "as many as possible" of all the cooperative office education students and cooperating business firms were contacted. Further information regarding the sample is not given, but from the table "Percentage of Replies to Each Form" it can be determined that 735 of the 1,112 employers contacted responded (66.1%) to part of the study, although fewer completed the employer rating form and that 294 out of 400 (73.5%) of COE graduates and 476 out of 900 (52.9%) of non-COE graduates responded to the Job Information Questionnaire.

Several instruments, with their development based on a literature review, were used to collect data: a questionnaire concerning factual information, opinions, and viewpoints sent to every New Jersey public high school principal; questions comprising background information, participating students, cooperating business firms, the COE coordinator, the State Department of Education, and additional information sent to each COE coordinator; questions sent to graduates concerning their cooperative job experiences (if they had any) and their present jobs; job-performance rating instruments sent to employers for completion. The questionnaires were sent approximately four months after graduation. All instruments were in written form, and they included rating scales, multiple-choice questions, and open-ended questions. None of the instruments are appended nor are reliability and validity discussed.

Data were tabulated using IBM computers; t-tests and chi-squares were used to test differences between COE and non-COE graduates. Several tables are provided. Among the 34 findings and conclusions reported are the following:

- Employers were strong supporters of COE.
- Only 20% of COE students were able to participate in school activities.
- Approximately 80% of the COE graduates were employed full-time in an office.
- COE graduates obtained jobs faster than non-COE graduates.

- There was no significant difference between COE and non-COE graduates at job entry in weekly gross wages received by office workers; however, at least one increase in pay was reported by significantly more COE graduates, and a significant difference in weekly gross wages was evidenced five months after graduation.

- Both COE and non-COE graduates experienced a high degree of job satisfaction.

- Supervisors indicate that both groups need to demonstrate more initiative in job performance.

- Although COE graduates received higher ratings than non-COE graduates in every area of job performance, the only ratings that were significantly higher (.05 or .01 levels) were in attitude toward work, attitude toward others, and overall ratings.

Twenty-eight recommendations are made, ranging from use of continuous reporting and follow-up systems, to more varied job-training experiences, to improved school-placement functions. Suggestions for further research are made, including a study to determine whether or not more secretarial than clerical students are encouraged to participate in COE programs and a feasibility study to determine the desirability of establishing certification standards for coordinators.

This study was done as partial fulfillment of the requirements for the author's doctoral degree. Permission to do the study was granted by the New Jersey Division of Vocational Education.

EVALUATIVE COMMENTS:

The most obvious problem with this study is the lack of sampling information. The reader is given no indication of possible response bias or of why all the responses were not used in the analyses (although presumably this was the result of incomplete responses). Further, although the author states that instrument development was based on a literature review, there is no indication of pilot testing or of consideration of reliability and validity. This information is necessary to determine how warranted the conclusions are.

For exploratory purposes and as a model for others, this study was quite thorough. Many factors were investigated from several perspectives, and statistical analyses were done. Further research along these lines should include consideration of intervening and control variables.

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"The Success of Vocationally Trained Women in Traditionally Male Occupations." David J. Pucel. Paper presented at the American Vocational Association Convention, New Orleans, December 9, 1974, 20 pp. (ED 141 504)

DESCRIPTIVE ANNOTATION:

With the passage of laws disallowing sex discrimination in employment practices, some educational institutions have stopped using sex as a basis for determining enrollment in particular programs. This study was done to examine a portion of the impact of this changing societal concept on vocational education. Four basic questions were asked:

- Are women exercising their right to enroll in the traditionally male occupational training programs[37] of the Minnesota Area Vocational Technical Institutes?
- Do women who enroll in traditionally male programs judge the training programs similarly to men enrolled in the same program?
- Do women who graduate from traditionally male programs receive or perceive equal benefits in the world of work?
- Do employers of the women who graduate from traditionally male programs judge them equal to men?

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[37] A traditionally male occupation was defined as an occupation in which at least 80% of the employees are males. Such occupations were identified through the 1970 Minnesota Census Data.

Only 21 females who graduated in 1972 or 1973 from traditionally male occupational training programs and on whom the Minnesota Vocational Follow-up system had data were identified. The study was continued in spite of this small sample because of the importance of the topic. The 21 females were drawn from eight program areas; 21 males were proportionately sampled from the same areas to complete the study sample. Data obtained from the Minnesota Vocational Follow-up System data tapes were analyzed using a chi-square technique. Several percentage tables are presented as well.

Among the findings and conclusions discussed are the following:

- The largest female enrollment in traditionally male areas was 51% and 46% in chemical technology for 1971-72 and 1972-73.
- None of the analyses of male and female judgments of their training programs yielded significantly different results.
- The first job salaries of the women were significantly lower than those of the men. Pucel notes that data collected did not distinguish among the occupations in which the respondents were employed.
- The employment-status differences one year after graduation were substantial, although not statistically significant--66.7% of the males were employed in training-related occupations compared to 38.1% of the females.
- The women who received training equal to that of men were not as satisfied with the employment they entered as were the men.
- None of the employer ratings of women were statistically different from their ratings of men. However, the women were rated lower in terms of quality of work, quantity of work, job-related knowledge, and equipment operation. Three possible reasons are offered: a difference in occupations, bias against women, and an actual difference in performance.

This study was conducted by a Professor of Vocational and Technical Education at the University of Minnesota who is also Director of the Minnesota Vocational Follow-up System.

EVALUATIVE COMMENTS:

The author cautions against making weighty decisions on the basis of this study because the sample was so small. Still, this has value as an exploratory study because it raises questions that can be investigated through further research.

* * *

Vocational Education Planning Districts in Ohio: An Economic Evaluation of Foregone Benefits from Limited Participation. I. A. Ghazalah. Columbus: Division of Vocational Education, Department of Education, State of Ohio, February 1975, 56 pp.

DESCRIPTIVE ANNOTATION:

The author states, "The purpose of the economic analysis of publicly financed programs is to assist decision-makers in the allocation of a given set of scarce resources among competing uses." This particular study was undertaken because "knowledge about the potential net benefits ... to society from increasing the percentage of senior high school students who receive job training should assist in the appropriate development of vocational education in [Ohio]." The specific objectives of the study were as follows:

- To estimate, on the basis of enrollment during the fiscal year 1973, Total Net Social Benefits (TNSB) from vocational programs at 11th and 12th grade levels in each of four sample vocational education planning districts
- To estimate the TNSB that would accrue from increasing enrollment in each sample to 40% of the average daily membership in those grades
- Based on sample data, to estimate for each planning district the TNSB for the fiscal year 1973 and the potential increase from increased enrollment
- To provide absolute, as well as, relative economic value of the array of vocational education programs

A sample of four vocational planning districts was selected for the study: (1) a single vocational district with eleven member schools; (2) a multiple vocational district with five member schools; (3) a small joint vocational school district with six member schools; and (4) a large joint vocational school district with sixteen member schools.

Three sources of data were used in the study: schools and school districts; the state Division of Vocational Education; and published data from the U.S. Department of Labor and the Ohio Department of Education. Interviews were held with school superintendents and administrators to obtain and clarify financial, enrollment, and program data about each school and follow-up data on its students. Trainees in each school completed questionnaires concerning demographic and earnings (from part-time employment during training) variables. The Division of Vocational Education supplied unpublished enrollment data. The published data sources provided wage rates, labor-force participation rates and survival probabilities, and cost-per-pupil data.

Although the objectives of vocational education are multidimensional, the state-of-the-art in economic analysis does not allow specification of a single functional relationship that uniquely encompasses all the dimensions. Therefore, "Since vocational education is principally aimed at increasing the productivity of human resources, this study [is limited] to an evaluation of vocational education as an investment goal, i.e., in terms of its contribution to the objective of raising the output of goods and services in the economy as measured by the increase in the earning power of participants in vocational education." Costs and benefits to society as a whole are evaluated. In the analyses, "Social Present Value I" is calculated with the assumption that without vocational education the student would have dropped out of school after the 10th grade to enter the labor market. "Social Present Value II" is calculated with the assumption that without vocational education, the student would have completed the 11th and 12th grades in the academic curriculum. Separate calculations were made for males and females.

Based on his calculations, the author concludes that, on an absolute basis, all the evaluated vocational programs--except child care--have positive social present values, making them worthwhile investments. The relative value varies with program, with methods of calculation of social present value, and with sex. Tables detailing these findings are provided. The computed estimates indicate that increasing vocational education participation by 40% would result in a statewide increase in net social benefits from $108,918,528 to $326,951,424.

The author of this document is a Professor of Economics at Ohio University. The project was supported by funds from the Ohio Department of Education, Division of Vocational Education.

EVALUATIVE COMMENTS:

The assumptions underlying the economic anlysis and the equations used are discussed in detail. However, the data used in the analysis are not. Sources of data are listed but there is no indication of how reliable the data sources are or how valid the trainee questionnaire was, and no indication of how any possible limitations in the data would affect the results.

* * *

Vocational Technical and Adult Education: Student Follow-up Study of 1974-1975 Completions. Jim Preston. Sarasota County, Florida: Sarasota County Board of Public Instruction, May 21, 1976, 68 pp. (ED 124 685)

DESCRIPTIVE ANNOTATION:

This is a report of the fourth annual study of Vocational Technical and Adult Education (VTAE) conducted in Sarasota County, Florida. It is based on data analysis provided by the local District Data Processing Department before the surveys were sent to the state centralized reporting station. Thus, this report was developed to give timely data to decision-makers before the narrative descriptions were written. The survey questionnaire addressed employment availability, employment status, job classification, quality of training, reason for employment outside a training-related area, average weekly pay, source of assistance in finding job, and postsecondary education. It was hoped that the information provided would increase the ability of decision-makers to allocate resources and to assist in planning, reviewing, and evaluating the vocational programs in Sarasota County.

This survey of 1974-75 completers was conducted in 1976. An alert card was mailed to the sample in January and the second survey mailing and personal contacts to nonrespondents were made in February.

The survey population was 1025 Vocational Preparatory program completers from the Sarasota County Vocational-Technical Center and three high school Home Economics and Cooperative programs. (A listing of specific courses and respective response rates is provided.) Many hours were spent in deleting from the state computer listings of vocational students the names of those taking only one course and that course for some reason other than job preparation. Names of 430 were deleted before the questionnaires were mailed. The response rate was 63%, which was raised to 67% by additional responses received after the deadline. Though not included in this report, these late responses were analyzed with very similar results.

A pilot instrument for the annual studies had been developed in 1971 and changed little until the time of this survey. Changes were made to accommodate federal requirements for collecting veteran and Comprehensive Employment and Training Act (CETA) data. The instrument appears in the report. The author states that, although validity studies per se have not been done, the high response rate and the lack of differences in responses between prompt and late responders should increase confidence in the data.

Tabular percentage data for the questions addressed are provided for each of the following groups: (1) the total survey sample, (2) students enrolled in home economics and cooperative programs, (3) total enrollment at the Vocational Technical Center (VTC), (4) VTC students enrolled in health occupations, industrial programs, and office occupations, (5) secondary students, and (6) postsecondary students.

Among the findings reported are (1) that of those available for employment in a training-related area, 80% were employed--64% of them in their area of training or a related field and (2) that, after completing their secondary programs, 22% of the respondents went on to post-secondary training--about half of them in a related program.

The annual studies are sponsored by State Department officials who supply survey forms and set the schedule for mailing them; this report was prepared by Jim Preston, Program Specialist, Placement and Follow-up, Sarasota County Board of Public Instruction.

EVALUATIVE COMMENTS:

This report consists, for the most part, of summary data tables, i.e., frequency (percentage) charts, with very little interpretation of results. A benefit of this format is that the report can be produced quickly, giving decision makers access to data before decisions have to be made. Another advantage is that specific information sought often can be more easily found in a table than in narrative form. However, there are disadvantages to this format as well. Frequency tables can be misleading in that they present only frequencies of occurrences--information that may be crucial to the interpretation of differences in frequencies is lacking. For this reason, those who consider the "data without interpretation" format should consider the disadvantages as well as the advantages.

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IV. EPILOGUE: RECAPITULATION AND ASSESSMENT

This epilogue summarizes substantive findings reported in the descriptive annotations and methodological issues discussed in the evaluative comments. It is intended to give the reader a quick overview of data-based claims made about some outcomes of vocational education. Readers are cautioned that findings presented here are inferences based on a review of the thirty-one studies included in this bibliography.

Several of the studies were designed specifically to provide information for describing or for improving particular programs, rather than to add to a body of knowledge about vocational education outcomes. Still, these studies are easily accessible to a wide audience, and their results may mistakenly be regarded as widely generalizable by individuals who are unfamiliar with the canons of research. It is hoped that this epilogue will be helpful in indicating where further research is needed and where improvements can be made in conducting and reporting evaluation studies. Thus, it is meant to be helpful both to readers of evaluation reports and to evaluators.

The methodological issues discussed here in reference to the annotated studies are discussed more generally and in greater detail in Section II above and in the references provided at the end of that section.

It is difficult to draw conclusions based on this set of studies because of several definitional problems:

- The populations studied are often not clearly defined.
- When populations are defined, reasons underlying the choice of definitions are not stated.
- Reasons underlying the choice of operational definitions[38] of the outcomes under study are not stated.

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[38] An operational definition indicates how an outcome is to be measured. For example, intelligence is frequently operationally defined by scores on a standardized intelligence test. Job satisfaction can be operationally defined by scores on a job satisfaction rating scale or by an employee's tardiness or use of sick leave.

After a discussion of difficulties created by definitional and other problems, the epilogue turns to methodological issues as they apply to several types of outcomes:

- Employment and education status
- Earnings
- Student satisfaction with training
- Job satisfaction
- Job performance

Populations

In general, the populations for these studies are sets of individuals who have been enrolled in vocational programs. However, terms are not used consistently in the different studies. For example, "high school vocational graduates" as used in one study may indicate those graduates who had taken a sequence of vocational courses in either the eleventh or twelfth grade, whereas in another study, the term may indicate graduates who completed two credits in a vocational program during a school year.

Not only is there inconsistency among studies in the use of various terms related to the population, but often the terms used are not clearly defined. This makes it difficult to determine when comparability exists. For example, studies may include "early leavers with marketable skills" along with program completers without specifying how such early leavers are distinguished from dropouts.

Presumably there are reasons underlying the specific definitional choices made. If those reasons were stated, it might be possible to determine what populations, although different in specifics, are comparable enough to be considered together by those wishing to draw conclusions. The thirty-one studies reviewed here are comparable, with respect to their populations, in that all address those students, graduates, or leavers characterized as "vocational" by the authors; however, it is difficult to determine if the populations are comparable with respect to any finer discriminations.

Operational Definitions of Outcomes

In most of the studies the operational definitions of the outcomes investigated are implicit, if not explicit.

For example, the reader can discover how an outcome was defined by perusing the questionnaire used in the study. In some cases, however, studies report on an outcome such as employment in a training-related field without indicating how "training-related field" is defined or determined and without appending the instrument. Thus, identical or similar labels may be used in different studies for outcomes that are not comparable. Table IV provides a list of several outcomes defined in ways that prevent comparisons among studies, along with examples of the questions left unanswered by definitions that are not explicit.

Table IV

OUTCOMES OFTEN NOT CLEARLY DEFINED--
AND RESULTANT UNANSWERED QUESTIONS

- Employment in occupational program area/in area related to occupational program (How are the two differentiated?)
- Job satisfaction (How is it evidenced? Is it an all-inclusive term or subdivided into areas of satisfaction such as earnings and working conditions?)
- Satisfaction with education or training (How is it determined? Did training help students find or keep a job? Would students recommend program to others?)
- Self-image, self-concept, self-esteem (As used, are these all labels for the same construct? How is the feeling measured?)
- Earnings (Does the term refer to hourly earnings or average annual income? How can various earnings variables be compared?)
- Employment/Unemployment rates (How are they calculated? Is the employment rate based only on those available for work?)

Other General Issues

The non-comparability of both populations and outcome definitions makes any attempt to draw conclusions from this set of studies difficult at the outset. For this reason, some other issues related to comparability of studies are relatively less important: for example, differences in response rates and data collection and analysis procedures. Still, these and other methodological issues are relevant to the assessment of outcomes in any given study and are not adequately addressed in several of these studies.

One such issue is response bias, which is particularly likely to occur in cases where the response rate is small. Even the studies that do attempt to analyze response bias fail to acknowledge that the factor(s) influencing tendency to respond may interact with the outcome(s) being assessed. When this is the case, bias cannot be analyzed easily. For example, if the unemployed tend not to respond to employment status questionnaires, this bias may not be discovered through analysis of demographic variables associated with the respondents and those nonrespondents who can be reached by phone.

Another issue is the reliability and validity of the data-collection tools or techniques. Few studies discuss the degree to which valid and reliable data have been collected. For example, when relatives are asked to report on an "unreachable" individual's employment status, there should be indication of whether the accuracy of the report was determined. Reliability and validity should be assessed even when the data collection appears to be straightforward.

A list of questions related to these and other issues is provided in Table V. These questions are left unanswered in most of the reports of studies annotated in this bibliography. A discussion of methodological issues related to particular outcomes follows the table.

Table V

METHODOLOGICAL QUESTIONS UNANSWERED
IN MANY OUTCOME STUDIES

- Were questions asked so long after the event (e.g., vocational training, first job) that one might question accuracy of recall?
- Was the study sample representative of the stated population? Were appropriate sampling procedures used? Was the response rate sufficiently large? Was response bias analyzed?
- Was the methodology powerful enough (sensitive instruments, appropriate data analysis, sufficiently large sample size etc.) to detect effects of the vocational program?

Table V (Continued)

METHODOLOGICAL QUESTIONS UNANSWERED IN MANY OUTCOME STUDIES

- Did the research design cover the probable threats to validity? What assurance is there that the observed result was a function of vocational education rather than of some unmeasured variable(s)? What comparisons were made? To what degree can the results be generalized to vocational programs in other settings?

- Were data collected from reliable sources? Was any verification attempted?

- Was the instrumentation or data collection tool/technique carefully developed, pilot-tested, and revised to promote reliability and validity?

- Were data collection conditions optimal--questionnaires easy to complete, trained interviewers, comparable conditions of administration?

- Are results that are statistically significant also meaningful? How much variance in the effect is associated with vocational education?

- Can differences confidently be attributed to vocational education rather than to chance? Were data collected in a way that permits statistical analysis? Was statistical analysis done when appropriate?

- When data were statistically analyzed, were appropriate statistics used? What assumptions were violated and with what probable effects?

- To what degree might factors/tendencies such as social desirability, acquiescence, and halo-effect influence questionnaire responses? And to what degree might some of these factors affect tendency to respond?

- When rating scales were used, what was the rationale for choosing response alternatives and assigning values to them? Might the structure of the alternatives have induced a positive or negative response bias? What was the rationale for collapsing across alternatives when the responses were analyzed?

Employment and Education Status

Some researchers differentiate "employment in area of training" from "employment in training-related areas," and others combine the two. Few describe the criteria for determining whether a job is actually in the area of training or is related to training, and if so, to what degree. Some ask the respondents whether their jobs were training-related whereas others ask for job titles and use the *Dictionary of Occupational Titles* to make a determination. Some report percentages of graduates or leavers with full-time jobs only, some report those with part-time jobs as a separate category, and others do not indicate their criteria for placing an individual in an employment category. Although the studies generally report graduates' employment status soon after the students left school (e.g., from six months to one year) the data may have been collected from six months to eight years later (does a job held eight years ago seem to have the same degree of training-relatedness to the respondent as it did during the first six months after graduation?).

Some studies report the percentage of employed graduates based on the total number of survey respondents whereas others use the number available for employment as the base. Some report employment status by occupational program area, some by sex, and others provide no partitions. Few studies compare employment status of vocational students to any other set of students or to any standards at all.[39]

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[39] Reporting rates of employment rather than unemployment creates problems of calculation and comparison. People who are employed ("worked at all as paid employees" during the survey week, according to U. S. Bureau of Labor Statistics [BLS] definitions) are easy enough to count, but in calculating a rate of employment, one must define and gather data for an appropriate base. This may be all labor force participants, only those people who are "available for employment," or some other population set. With the base determined, however, what comparisons can be made to give meaning to the rate calculated for the vocational graduates? Labor force statistics published by state and federal government agencies focus on unemployment (i.e., number of unemployed workers divided by the civilian labor force), rather than employment. Unless the base used in computing employment rates for vocational students is the same as the BLS base used in calculating unemployment rates, it is not possible to convert the rates for purposes of comparison. Thus, if an evaluation

This variation makes it difficult, if not impossible, to draw valid conclusions. It does appear that on the average, a greater percentage of postsecondary vocational graduates find employment and particularly training-related employment than do high school vocational graduates. The reasons, however, are not addressed; among the possibilities are that high school graduates prefer to seek further training or receive more specialized training and are therefore more marketable, and that employers consider young adults more desirable than teenagers as employees. It also appears that graduates of some occupational program areas are more likely than graduates of others to obtain employment and to obtain training-related employment. Further, the occupational program areas may interact with level of education.

Some areas for further research are obvious: definitions must be specified; comparisons need to be made; the correlates of employment/unemployment status (for example, occupational program, sex, educational level) need to be investigated.

The findings relevant to educational status suffer from the same general problems. It appears that more high school graduates seek further education or training than postsecondary graduates, certainly not an unexpected finding.

Earnings

Conclusions about earnings are even more difficult to draw than conclusions regarding employment or education status. When results are reported strictly as dollar amounts, any comparison between studies failing to consider the year of the study and geographic differences in prevailing wage rates would not be meaningful. Not only do many studies report dollar amounts without providing other data necessary for interpretation, but they also fail to compare earnings of vocational graduates with those of other graduates or with other standards, and they fail to partition graduates by program area. Further, some studies report hourly earnings, others report beginning weekly gross earnings, and others "accumulated income." In order for earnings to be an

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[39] report indicates an employment rate of 92% for vocational graduates whereas the official unemployment rate for the relevant age group is 16%, anyone reporting that the unemployment rate of vocational graduates was only half that of the general population would be in error, and any inferences drawn from that conclusion would be misleading.

appropriate outcome criterion for evaluating vocational education, the research community must agree on some appropriate comparison groups and on some standard metrics.

Student Satisfaction with Training

Students are considered highly satisfied with training when they agree with statements like the following:

- If I had the choice to make again, I would choose the same program.
- I would recommend my program to other students.
- My training helped me to get my job.
- My training has helped me on the job.
- I was satisfied with my training.

This outcome was assessed through written or telephone questionnaires, sometimes with multiple items, sometimes only one, sometimes using a yes/no format, sometimes using a five-point rating scale. Although some researchers indicate that they pilot-tested their instruments, few discuss any aspect of instrument development or validation. Without careful development and testing there is no indication to what degree respondents' answers are influenced by response sets such as acquiescence, halo effect, or leniency;[40] by ambiguous or unclear statements; or by inadequate response choices (i.e., no response fitting what the respondent wants to indicate). Thus, the only conclusion easily drawn is that, when asked, most graduates will indicate a high degree of satisfaction with their training.

Further research is needed in two areas: instrumentation and correlates of satisfaction. If student satisfaction with training is important, it is certainly important to know what fosters and what hinders it; it may also be important to know what effects it has. To adequately assess any aspect of training satisfaction, the instruments must be carefully developed and their validity and reliability must be analyzed. Much research has gone into the development of instruments for assessing various attitudes; such research is needed in the area of training satisfaction as well.

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[40] Acquiescence is the tendency to make positive responses; halo effect refers to the tendency to say good things about every characteristic based, for example, on a general positive feeling about what or who is being rated, or on one strong point; and leniency is the tendency to give the more positive rating when unsure of which rating to give.

Job Satisfaction

Job satisfaction has been determined in two ways: through use of a published job satisfaction scale and by asking a single question on a questionnaire or telephone interview, something like, "Are you satisfied with your job?" The issues in assessing job satisfaction, then, are similar to those in measuring training satisfaction, and the suggestions for further research are analogous. Further, some studies suggest that job satisfaction is higher for graduates in training-related jobs, but others do not distinguish those with training-related jobs from those with other jobs. This, then, is an area needing further research.

There is a body of literature on job satisfaction,[41] indicating that it is a multidimensional concept amenable to assessment from various perspectives. For example, job satisfaction may be inferred, in part, from turnover rates and use of sick leave. Vocational education researchers would do well to examine the literature and to do further research on what kinds of measurement are most appropriate for evaluating vocational education against a job-satisfaction criterion.[42]

Job Performance (Attainment of Occupational Competencies)

One way to evaluate job performance is to ask employers how their employees perform on the job, the only technique

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[41] See, for instance, Robert P. Quinn and Martha S. Baldi de Mandilovitch, Education and Job Satisfaction: A Questionable Payoff (Washington, D.C.: U. S. Department of Health, Education, and Welfare, National Institute of Education, March 1977).

[42] See Kenney E. Gray, Marie Abram, and Floyd McKinney, Vocational Education Measures: Instruments to Survey Former Students and Their Employers (Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1978) for a review of some of the instruments available.

(beyond asking the graduates whether their training contributed to their job performance) used in any of the thirty-one studies presented in this bibliography. This is not to say that performance testing is not done, but it does not appear to be done often in vocational education outcomes evaluation.

Only a few of the thirty-one studies reviewed in this bibliography sought employer perceptions, and those that did are fraught with problems limiting the degree to which their results contribute to knowledge about the job performance of vocational education graduates. One problem is the use of presumably untested, unvalidated rating scales. As discussed in the section on training satisfaction, without careful development and testing there is no indication to what degree respondents' answers are influenced by factors unrelated to the substantive content of the rating scale.

Another problem is that data indicating the extent of employers' experience with vocational graduates have not been collected (for example, total number hired, percentage of employees from vocational programs, how long vocationally-trained employees have been used). Further, the data that have been collected have not been verified. For example, hiring-preference data consisting of questionnaire responses have not been verified by inspection of personnel records.

Finally, comparative data have not been collected. Some questionnaire items asked whether graduates of vocational programs were better employees than graduates of general programs, but none compared performance ratings of vocational and non-vocational graduates.

With all these difficulties, the only conclusion that can be drawn from these studies is that employers tend not to express dissatisfaction with employees who are graduates of vocational programs. Further research is needed to overcome the problems discussed above. More studies should address multiple factors of performance to discover whether vocational education affects some factors but not others. It cannot be overemphasized that there are several problems inherent in the use of rating scales that can be summarized by the statement that a rating scale often reveals more about the rater than about the substantive content of the scale. Thus, it is very important that rating scales be carefully derived and thoroughly tested and that verification be done where possible through use of other assessment techniques.[43]

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[43] See Darcy, Perspective, for a discussion of types of data that can be collected for evaluation purposes.

Other Outcomes

Other outcomes addressed in some of these studies include leadership, voting behavior (as a proxy for societal participation), self-image, academic standing, success of women in traditionally male jobs, and dropout rates. These outcomes were not addressed by enough studies to permit synthesis of findings. In most cases, the research suffered from the limitations discussed above in reference to particular outcomes.

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[44] This index is provided for the reader who is interested in who sponsors empirical outcome studies. The sponsors often are not explicitly identified; attribution of sponsorship thus is sometimes an inference. Complete citations for these documents are provided along with the annotations on the pages indicated.

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For Further Information

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